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THE mobilization of American industries for purposes of defence—this, on paper, is without doubt an excellent plan. It gives work for more commissions, shows us where we are weak and where strong, and guessing frankly, that is the end of it.

As for the ability of existing rubber plants to supply what our army and navy may need in peace or in war, that is easily gotten at. A competent government clerk with an able-bodied mimeograph could get the whole story in a week. The result would be the assurance that for the great essentials, rubber blankets, coats, boots, hospital supplies and tires, existing factories are fully prepared to swamp the war department at the very shortest notice.

Preparedness in manufactured rubber goods is solved. Not so, however, with crude rubber preparedness. Any eventuality that cuts off our supplies from

the Far East and from the Amazon would effectually stop the manufacture of all rubber goods. A commission to solve the problem of our supply of crude rubber, to report in favor of a government-owned supply of crude rubber sufficient to last a year, with another of rubber scrap to last two years, or a plant equipped to make 1,000 tons of synthetic rubber a day would be a heap more interesting. And who shall say that it would not be more practical?

THREE HUNDRED MILLIONS IN RUBBER.

THE preliminary report of the census of the rubber manufactures sent out the middle of last month gives some striking figures as to the magnitude of this important industry. It is a matter of congratulation that those in charge of the census adopted, at least in part, the suggestions offered by THE INDIA RUBBER WORLD in 1911. Previous census figures gave but three groups for this industry, namely: "belting and hose"; "rubber boots and shoes"; and "rubber goods not elsewhere specified."

It was suggested that it would be valuable to the trade, were separate figures given for automobile and cycle tires, solid tires, druggists' rubber sundries, hard rubber, reclaimed rubber, cements, coated fabrics (including mackintoshes, clothing, etc.), and dental and stamp rubber. While not all these suggestions were adopted, in place of the three headings, we have thirteen. Rubber tires, which hitherto were included in "goods not elsewhere specified" are now given the prominence their importance warrants, as nearly one-half the entire product of rubber manufactures. Separate totals are given for automobile casings, inner tubes, solid tires, and motorcycle, bicycle and aeroplane tires. Boots and shoes, belting, hose, packing, clothing, druggists' and stationers' supplies are the other divisions, after which comes "all other manufactures of rubber," and "all other products."

These latter divisions are most comprehensive. They probably include hard rubber (sheet and rod), battery jars, insulating apparatus, carriage cloth, dental rubber, stamp rubber, notions (such as dress shields, etc.), cements, shoe findings (soles, heels, inner soles, sole fillers, etc.), sporting goods, general mechanical goods (such as deckle straps, couch rolls, etc.), mats and matting, and brewers', plumbers' and bottlers' supplies. Undoubtedly manufacturers of these lines would like to have them separately enumerated, but perhaps this is asking too much, and we should be thankful that we are getting far more details this year than ever before.

The figures for insulated wire were given in the census of previous years, but are not separately given in this preliminary report. It is safe to say, however, that this branch of manufacture has grown proportionately, owing to the substitution of electric power

and consequent decreased use of belting. (The 1909 census figures are, \$51,625,000.)

Belting is given separately, but in previous years was grouped with hose. These two branches show but a fractional increase over 1909 figures, doubtless in part due to above-mentioned change in power transmission.

This is the first time scrap rubber and reclaimed rubber are given in the census reports. These materials are valued at over \$12,500,000. This reckoned at seven cents per pound, a very low average, would mean nearly 90,000 tons of scrap and reclaimed rubber, showing how important are these materials in the rubber industry.

In a report of the census of the industry taken in 1909, we compiled figures of the principal accessory industries, in which the rubber is used to a large extent. A similar calculation with such figures as are now available from the 1914 census, without adding insulated wire, brings the total beyond \$300,000,000. More than a million dollars each productive day of the year puts the rubber trade among the great industries of the country.

TIRE TEXTS.

THE beginnings of texts, or advertising catch phrases, for tires were in the early bicycle days when a simple rectangular card bore the legend "Morgan & Wright Tires Are Good Tires." This text on posters, letter-heads, catalogs and in advertisements was, in its way, a bit of genius.

It was most natural, therefore, that when the motor tire made its bid for popular approval, the alert minds that planned the selling campaigns should cast about for motor tire texts equally apt. One of the cleverest, "The Best In The Long Run," was also one of the first to appear. It was closely followed by "Time To Re-tire," a picture of a very sleepy youngster, giving the needed double entendre. Indeed, it is possible that the pleasant picture forestalled the pang that re-tiring costs the average motorist.

"Mightier Than The Road," has a certain oratorical flavor that is impressive. A captious critic might complain that, strictly speaking, roads do not possess might. It may also be suggested that American roads are mighty bad, but of course that is slang. "Made To Make Good" was well intentioned, but hardly euphonic. "Made To Make" hits one's sense of consecutiveness where it is particularly tender. "The Man With A Red Tire Knows" is a bit mystical, but not more so than its suggested alternate, "The Man With A Red Nose Tires." There are many more, all more or less clever, all doing their best. Be they praised or criticized, they are very difficult sentences to create. Further than this, whether praised or criticized, the end is attained,—attention is drawn to the special tire to which the text belongs.

THE PASSING OF THE DRY HEATER.

FROM the time of Leverett Candee to the present, rubber shoes have been made up, varnished and cured in one uniform, orthodox manner. Minor innovations such as sole-cutting machines and ten-roll calenders came in, to be sure, but in no way affected the established order of things. The rows of making-up tables with crowds of busy-fingered girls, the dripping varnish room, the cavernous dry heater, were integral parts of a system that was founded solidly on experience. No change was needed, none was imminent; nay, none seemed possible. Especially was this true of the curing. And yet almost in a day came the pressure cure and the most important part of rubber shoemaking was revolutionized. The question that at once obtrudes itself is, "Where will the innovation stop?" The mechanical goods manufacturers, the hard rubber men, the makers of druggists' sundries, have long been dominated by pressure in vulcanization, and their goods have been the better for it. And now that rubber shoes are pressure-cured, what of other goods of the dry heat kind? How about surface clothing, mackintoshes, carriage cloth? Is it a good guess that the pressure cure will in time enfold them, too, in its warm embrace?

THERE ARE SOMEWHAT GRAVE FEARS, BOTH IN GREAT Britain and in this country, that at the conclusion of the European war Germany will at once endeavor to regain its export trade by offering, in foreign markets, manufactured goods which have accumulated, either as such, or made from materials thus collected, at prices so low as to kill all competition.

In Great Britain an active movement has been started in favor of an anti-dumping law. In this country similar legislation has been agitated. Doubtless there are lines of industry which may be thus affected, but a perusal of "The Rubber Situation in Germany," as reported by our correspondent, on another page, will allay such fears, if any are entertained by manufacturers in the rubber trade. Germany has no such surplus. In fact, her manufacturers could find immediate use for thousands of tons of crude rubber, were they able to procure it. This industry, at least, can rest assured that there will be no post-bellum ruinous competition from Germany.

IT IS CERTAINLY GRATIFYING TO READ THE words of so able a man as Vice Chairman Hurley of the Federal Trade Commission in appreciation of the trade journal and the trade association, both of which he deems most important factors in the progress and prosperity of the trade. His address given on other pages in this issue, is worthy of careful perusal by manufacturers and business men. He points out some of the disadvantages under which American industries are laboring, advises conservation and co-operation, and outlines some of the work being done by the Government Commission, of which he is an important officer.

Pressure Cure of Rubber Footwear.

A RUBBER boot or shoe is made by assembling upon a form or last the various pieces of unvulcanized rubberized fabrics and sheeted stock which form the lining, stay pieces, exterior waterproof and wearing parts of the boot or shoe. This work is done by hand, and the thoroughness with which the tacky stock is made to adhere by the process of hand rolling has much to do with the length of service obtainable from the goods.

Boot and shoe making is generally done by piece work and hurriedly, therefore there are liable to be some small places in the goods where adhesion is imperfect and any air confined between the plies, prevents contact and weakens the structure.

Such faulty work may not always be discovered by inspection, and is liable to develop unlooked-for failures in service.

The usual method of curing rubber boots and shoes consists in exposing them on racks in large, dry heaters where the temperature of the air is slowly raised by steam circulating in coils beneath the racks. Moisture and volatile products escape by natural ventilation through openings in the roof of the heater. The air, a poor conductor of heat, circulates slowly and without pressure. The working conditions are therefore not under positive control, and the time of vulcanization is long, usually from eight to ten hours. The fact that the goods, during vulcanizing, are not under pressure permits the formation of blisters wherever included air or moisture is present. The loss from this cause is sometimes very considerable, and difficult to remedy. Other defects of the dry heater system of curing are irregularity of cure, due to faulty circulation of the air; excessive space required to handle the goods, because the cure is protracted unduly, and large cost for operation. Notwithstanding these defects and drawbacks, the dry heater has remained the standard method for curing footwear since the earliest days of rubber manufacturing.

The rubber boot and shoe industry is indebted to Hon. A. O. Bourn of Bristol, Rhode Island, for the introduction of the first practical process for the pressure cure of footwear, which he developed in his own works at Providence, R. I. Since his invention several others have been perfected, the work chiefly of American manufacturers. These methods of pressure cure mark the most important recent advance in the boot and shoe branch of the rubber industry, because they bring under control and obviate many of the troubles and inconveniences inherent in the older process of curing footwear.

Manufacturers are now able, by these inventions, to control the vulcanized process and produce better goods with fewer

"seconds." It is now possible to expel all air trapped between the plies in making, and under pressure to cure the shoe structure compactly together. Pressure cure, by direct steam, also allows the use of tough wearing and oil resisting mechanical stocks, such, for example, as automobile tire tread compound.

Other important advantages, due to these improved methods, are great economy of space formerly devoted to

heaters, and a very important saving of time in vulcanizing. These points materially increase the curing capacity of a factory while the effectiveness of the process not only produces better goods, but permits the manufacture of boots and shoes of any desired color. This matter of freedom in color selection is an important one from a trade viewpoint, adding markedly to the variety and attractiveness of the goods.

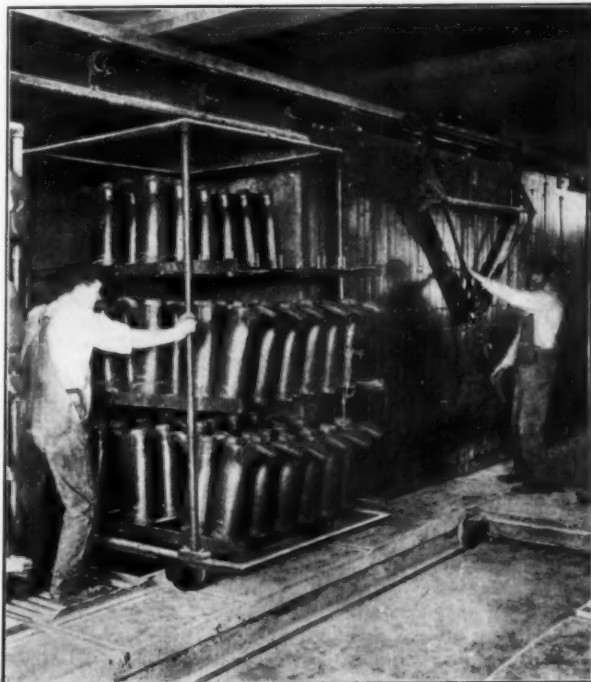
No data are available for ascertaining the reduction in cost attributable to pressure cure, over open cure for footwear. Undeniably a favorable margin exists which makes it possible for the manufacturer to readjust qualities and values; a matter of first importance to the users of the goods. That such a readjustment does take place may be illustrated by the authentic account of a pair of pressure-cured boots worn by a certain car inspector. The story is to the effect

that he subjected these boots to 26 months of actual service, or 760 days of wear, walking in this period 5,728 miles. The boots were provided with soles of tough automobile tire tread stock, but their endurance is justly credited, in part, to the compactness attained by reason of the pressure used in curing. Such wearing quality would not be expected from the best rubber boot vulcanized by the customary process.

In the manufacture of mechanical goods the standard methods of cure have commonly been pressure methods by steam heat, applied either in an atmosphere of steam or by steam heated molds. The patented processes of pressure cure for boots and shoes are adaptations of these means to the special conditions of footwear manufacture by evolving certain general methods for removing trapped air and curing the goods compactly.

These methods may be considered in three groups:

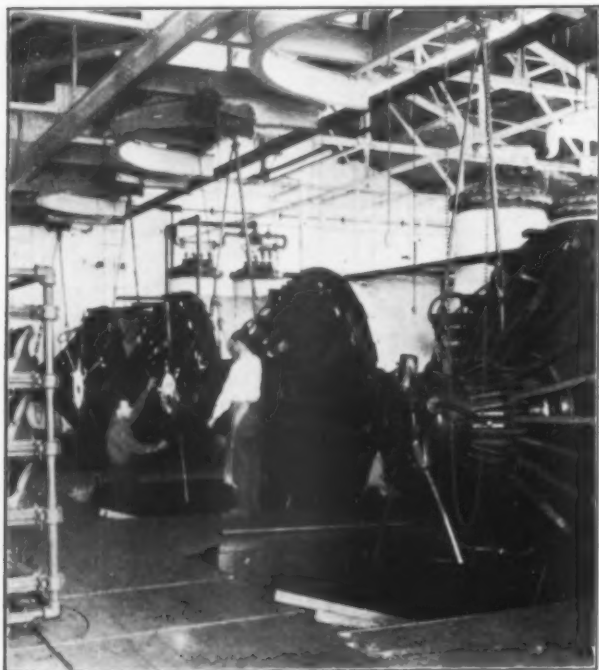
1. Consolidation of structure of the goods by pressure of air or non-oxidizing gases and the application of their heat or that of steam.
2. Removal by vacuum of entrapped air and vulcanization by pressure and heat applied by air, non-oxidizing gases or steam.
3. Compression of the goods by inflation or otherwise, in a mold heated internally or externally, by steam, for vulcanization.



REGULATION DRY HEATER FOR FOOTWEAR.

GROUP 1

1. **BOURN'S AMMONIA METHOD.**—By the evaporation of ammonium carbonate in a vulcanizing chamber adapted to retain pressure, an atmosphere is secured in which boots and shoes are cured in about three-quarters of an hour. The vulcanizing heat is derived from steam circulating in a jacketed space surrounding the curing table.



BATTERY OF PRESSURE PROCESS VULCANIZERS, CLOSED.

2. **BOURN'S COMPRESSED AIR METHOD.**—Compressed air in the curing chamber is employed to solidify the goods and to hasten vulcanization by its increased conductivity. Heat is supplied by steam circulating in a surrounding jacket.

3. **DUNCAN TOUSLEY METHOD.**—The goods, upon lasts, are sealed against the contact of air or steam. With this protection they are placed in a vulcanizing chamber which is hermitically closed. Air, heated to 280 degrees F., is introduced until the pressure reaches 60 pounds. The air is retained in the chamber about 45 minutes, until the goods attain approximately 270 degrees F. The air supply is then cut off and the confined air displaced by steam at about 80 pounds pressure. Vulcanization takes place in dry steam. At the completion of the process the steam is displaced by air to cool the goods before opening the vulcanizer.

4. **HILL'S METHOD.**—The goods, upon lasts, are vulcanized in an atmosphere of dry carbon dioxide maintained at any desired pressure up to 100 pounds per square inch. The walls of the vulcanizing chamber are heated by a steam jacket, and the interior of the vulcanizer by a steam coil.

5. **COCKBURN'S METHOD.**—An ordinary single or double-jacketed vulcanizer is employed in which the goods, on lasts, are placed and heated by dry steam in an atmosphere of compressed air.

6. **RUTHERFORD'S METHOD.**—The goods are made upon special lasts provided with ducts for the withdrawal of moisture from the shoes, and adapted for connection as part of a tubular frame car attachable to an air pump inlet in the shell of the vulcanizer. Thus connected the moisture can be withdrawn from the goods and vulcanization effected subject to the action of a controllable pressure.

GROUP 2

1. **WARNER'S METHOD.**—The goods, on lasts are placed in a vulcanizer which has been previously heated. By means of a vacuum, all the confined air and volatile gases are removed from the heated goods, after which a constant pressure of pre-heated air or inert gas replaces the vacuum during the period of vulcanization, and the required temperature is maintained until completion of the cure.

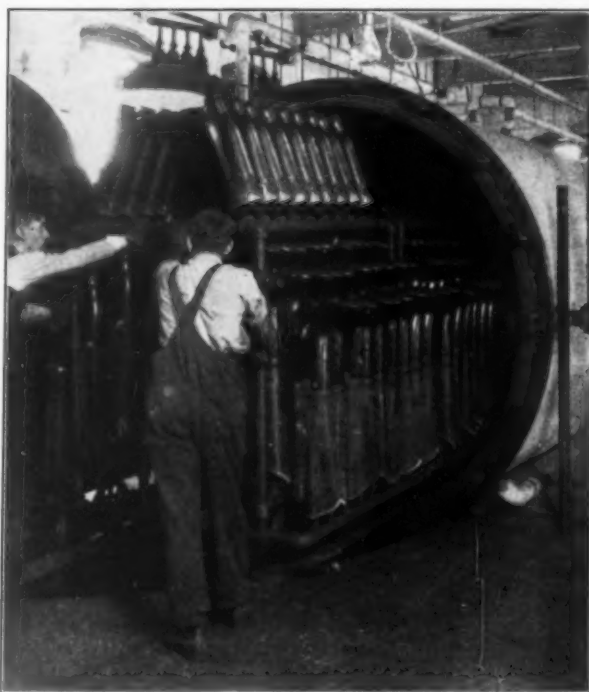
2. **CROWLEY'S METHOD.**—The goods are built on lasts adapted for attachment to a device for removing the trapped air or moisture. The goods may then be vulcanized by any suitable means, using hot air or gases with or without pressure.

3. **HILL'S METHOD.**—One of the objects of this process is the exclusion of the air from contact with the rubber during vulcanization, to avoid oxidation. To attain this, a thin, steam-tight, rubber-and-fabric envelope is provided to fit over the shoe and from this the air is removed, causing it to conform snugly to the contour of the shoe. It is then tightly sealed in that position. With each boot or shoe thus prepared, the goods are cured in an atmosphere of steam.

4. **PRICE'S METHOD.**—The shoe or boot is built up on a special last or boot tree with perforated walls and mounted so that the interior and exterior pressure conditions can be controlled, the interior pressure being less than the exterior pressure either before or during vulcanization, or both. By this means, air is removed from the materials and the structure of the goods. Hot air, hot gases or other means may be employed as the vulcanizing medium. The method also provides for pressure control in connection with the heating medium during vulcanization.

GROUP 3

1. **HIGGINS' METHOD.**—A special list is provided with an inflatable surface section and serves as a core for an internally



PRESSURE CURE VULCANIZER RECEIVING A CAR OF BOOTS.

steam-heated mold. Against the interior of this mold the shoe is compressed by air to solidify the plies of material.

2. **FIELD'S METHOD.**—The goods are compressed on metallic

lasts by enclosure in three-part separable molds, against the interior of which they are forced by an inflating pressure of air.

3. **DOUGHTY'S METHOD.**—This consists essentially of molding the goods upon a metal last or core in a three-part, steam-heated mold and exerting pressure on the rubber goods by mechanical means.

METHODS OF CONSOLIDATING FOOTWEAR PREVIOUS TO VULCANIZATION.

Two recent United States patents, having an indirect connection with the pressure cure of rubber footwear, should here be mentioned.

The object of both is to compact the structure of the goods by removing the wrinkles and interlaminated air, by fluid pressure, preliminary to vulcanization. The latter may be effected by any appropriate means. Both are improvements on the common hand roller process of making rubber shoes.

Randall's apparatus consists of a device for holding boots on lasts, under pressure in an adjustable, bell-shaped tank. A pressure of 90 to 100 pounds of air is exerted upon the unvulcanized goods. This effectively solidifies their structure,

expels all contained air, and secures perfect adhesion between the rubber plies and seams.

Piper's apparatus for a similar purpose is particularly adapted for the treatment of rubber shoes by either pneumatic or hydraulic pressure. It is a bench machine operated by the individual shoemaker and consists of a base plate to which is hinged a dome-like cover; the enclosed space is large enough to contain a rubber shoe on its last. The shoe rests on a diaphragm secured to the edges of the lower section of the base and is surrounded by another diaphragm similarly secured to the edges of the dome or cover section. These surrounding diaphragms have a combined internal contour approximating that of the last. The diaphragm arrangement is such that it is capable of handling a wide range of sizes and styles of shoes.

The process is essentially one of cold-molding the goods. Air or hydraulic pressure is admitted back of the upper and lower diaphragms which close snugly upon the shoe, compacting the plies of unvulcanized stock and expelling the air, which escapes between the edges of the shoe cavity. Subsequently the goods are vulcanized as usual by dry heat without pressure.

The Rubber Industry and the Census of 1914.

DIRECTOR S. L. Rogers of the Bureau of Census, Department of Commerce, has sent out a preliminary statement of that portion of the 1914 census of manufactures which refers to the rubber industry. This gives a somewhat detailed statement of the quantities and values of the various products manufactured, and is subject to such changes and corrections as may be found necessary from a further examination of the original reports.

The report is a summary of statements received from 331 establishments. The products of 23 of these establishments were rubber boots and shoes; of 18, rubber belting, hose, packing, etc.; and of 290, automobile tires or casings and inner tubes, motorcycle and bicycle tires, rubber clothing, druggists' and stationers' sundries, and other miscellaneous rubber goods. The products reported for 331 establishments for 1914 were valued at \$300,251,827. At the census of 1909, 267 establishments were reported, with products valued at \$197,394,638. The increase in value of products, therefore, was \$102,857,189, or 52.1 per cent. In addition, rubber products to the value of \$446,688 were reported in 1914 by 14 establishments engaged primarily in other lines of manufacture but which produced rubber goods as subsidiary products.

This report is, in some respects, far more satisfactory as regards details than similar reports of previous census years. In those reports but three divisions were made, namely: "belting and hose," "boots and shoes" and "rubber goods not elsewhere specified." The output of the tire business, which today represents nearly one-half the total value of manufactures of rubber, has been in former reports lumped with all other manufactures, except belting, hose and footwear. Therefore no exact comparison of the growth of this branch of the rubber industry is available, but it may be safely assumed that the increase of 52.1 per cent in the total annual output of rubber goods during the five-year period is accounted for in very large part by the enormous growth of this branch of the industry. There was reported the manufacture of 8,020,815 automobile tires or casings, valued at \$105,671,223; of 7,906,993 automobile inner tubes, valued at \$20,098,936; of solid tires for motor and other vehicles, to the value of \$13,735,681; and of 3,728,138 motorcycle, bicycle, and aeroplane

tires, valued at \$6,905,852. The total value of tires produced in 1914 was \$146,411,692, which was 48.8 per cent of the total value of all kinds of rubber goods produced.

Second in importance is the manufacture of rubber footwear. There were manufactured during the year 4,024,486 pairs of boots, and 57,211,728 pairs of shoes. These totaled in value \$50,506,156, which is rather disappointing when compared with the figures of the last decennial census which were 49,721,000. This comparison judged only by the figures, would indicate an almost entire absence of progress in the rubber footwear trade, but this industry is so dependent upon weather conditions that no one year is likely to give a fair and just estimate. The year 1914 was a comparatively light one, as regards rubber footwear trade. Had the census given 1915 figures, the comparison would have been more favorable, and more just.

Belting and hose were lumped together in the last decennial census, the amount reported produced in 1909 being \$24,729,000. The value of these in 1914 is placed at \$28,340,749. Packings were given as worth \$12,160,000 in 1909, and only \$3,507,651 in 1914.

The 1914 statistics are summarized as follows:

| | |
|---|---------------|
| Number of establishments | 331 |
| Total value of products | \$300,251,827 |
| Boots: | |
| Pairs | 4,024,486 |
| Value | \$12,647,934 |
| Shoes: | |
| Pairs | 57,211,728 |
| Value | \$37,858,222 |
| Tires: | |
| Automobiles— | |
| Casings— | |
| Number | 8,020,815 |
| Value | \$105,671,223 |
| Inner tubes— | |
| Number | 7,906,993 |
| Value | \$20,098,936 |
| Solid, all kinds— | |
| Value | \$13,735,681 |
| Motorcycle and bicycle (including aeroplane tires)— | |
| Number | 3,728,138 |
| Value | \$6,905,852 |
| Belting | \$7,989,405 |
| Hose | \$16,853,693 |
| Packing | \$3,507,651 |
| Clothing | \$6,396,810 |
| Druggists' and stationers' sundries | \$7,527,755 |
| All other manufactures of rubber | \$9,983,969 |
| Scrap and old rubber (sold or on hand) | \$1,297,487 |
| Reclaimed rubber (sold or on hand) | \$11,252,133 |
| All other products | \$8,525,076 |

Financing Imports of Plantation Rubber.

CRUDE rubber, like other raw products, may be purchased in the Far East, transported to this country, manufactured and sold before any money is paid by the importing manufacturer, if a banker esteems the importer's reputation, financial standing and responsibility such as to warrant the issuance of a

commercial letter of credit and subsequently the releasing of the raw material under the conditions of a trust receipt.

To clearly understand the general system of import credits as applied to the rubber industry an imaginary transaction will be described in which fictitious names are used.

Let it be supposed that John

Smith & Co. are rubber dealers at Singapore, Straits Settlements. When the New York representative of the latter concern arranges with John Jones & Co. for the sale of a certain lot of crude rubber, Smith's New York representative cables in code to the Singapore house that the sale has been consummated, the understanding being that William Smith & Co. will receive payment in the form of a draft at 90 days' sight, drawn under a commercial letter of credit on the London correspondent of John Jones & Co. Previous arrangements had, of course, been made that William Smith & Co. would be provided with such a banker's letter of credit under which the draft would be drawn to finance the purchase.

While the Singapore exporter is completing his arrangements for shipping the rubber, John Jones & Co. go to their bankers in New York, with the statement of the conditions under which purchases are to be made and request the issuance of a commercial letter of credit. The form used in making this application is shown in Fig. 1.

This application requests cable advice of the credit, which is customary for rubber dealings in the Far East on account of the distance. The amount of the credit desired is, say £5,000, although this first purchase costs about one-third of that amount, the idea being that the balance of the credit may be drawn to pay for other purchases up to the total amount of the credit at any time before the date of its expiration, which is July 1, 1916. This is done to avoid the issuing and cabling of small credits for each subsequent transaction.

At the time of issuing the letter of credit John Jones & Co. are required to sign an agreement or "obligation" shown in Fig. 2, which provides that they will supply funds to meet

SPECIMEN
APPLICATION FOR COMMERCIAL CREDIT

New York, *February 16th 1916*

----- Trust Company -----

Dear Sir:

Please issue for our account a Documentary

Credit to favor of *William Smith & Co., Singapore*

for *£5,000* --- drafts at *90 days sight*

against *Bill of Lading of shipment of Crude Rubber*

from *Straits Settlements to United States*

Is from until *July 1st 1916*

including *freight* and *insurance* effected in *New York*

CABLE

Kindly advise the Credit by

Yours truly,
(signed) John Jones & Co.

No. *6743*

FIG. 1.—APPLICATION FOR CREDIT.

Jones & Co., of New York City, are rubber manufacturers who import at least some of the crude rubber they use. William

SPECIMEN AGREEMENT

New York, *February 16th 1916*

To the

----- Trust Company -----

Gentlemen:

Having received from you the Letter of Credit of which a true copy is on the other side, I hereby agree to its terms, and in consideration thereof I agree with you to provide in New York, twelve days previous to the Maturity of the Bills drawn in virtue thereof, sufficient funds in cash, or in Bills in London, satisfactory to you, at not exceeding sixty days' sight, and endorsed by you to meet the payment of the same with *three per cent* for your commission and interest as hereafter provided, and I undertake to secure at *my* expense, for your benefit, against risk of Fire or loss, all property purchased or shipped pursuant to said Letter of Credit, in Companies satisfactory to you.

I agree that the title to all property which shall be purchased or shipped under the said credit, the bills of lading thereof, the policies of insurance thereon and the whole of the proceeds thereof, shall be and remain in you until the payment of the bills referred to and of all sums that may be due or that may become due on said bills or otherwise, and until the payment of any and all other indebtedness and liability now existing or now or hereafter created or incurred by you to you on any and all other transactions now or hereafter had with you, with authority to take possession of the same and to dispose thereof at your discretion for your reimbursement as aforesaid, at public or private sale, without demand or notice, and to charge all expenses, including commission for sale and guarantee.

Should the market value of said merchandise in New York, either before or after its arrival, fall so that the net proceeds thereof (all expenses, freight, duties, etc., being deducted) would be insufficient to cover your advances thereon with commission and interest I further agree to give you on demand any further security you may require, and in default thereof you shall be entitled to sell said merchandise forthwith, or to sell "in arrears," irrespective of the maturity of the acceptances under this Credit, I being held responsible to you for any default, which I, bind and oblige myself to pay you in cash on demand.

It is understood that in all payments made by you to me in the United States, the Pound Sterling shall be calculated at the current rate of exchange for Bankers' Bills in New York on London existing at the time of settlement, and that interest shall be charged at the rate of five per cent per annum, or at the current Bank of England rate in London if above five per cent.

Should I anticipate the payment of any portion of the amount payable, interest is to be allowed at a rate one per cent under the current Bank of England rate.

In case I should hereafter desire to have this credit confirmed, altered or extended by cable (which will be at *my* expense and risk), I hereby agree to hold you harmless and free from responsibility from errors in cabling, whether on the part of yourselves or your Agents, here or elsewhere, or on the part of the cable companies.

This obligation is to continue in force, and to be applicable to all transactions, notwithstanding any change in the composition of the firm or firms, parties to this contract or in the use of this credit, whether such change shall arise from the accession of one or more new partners, or from the death or secession of any partner or partners.

It is understood and agreed that if the documents representing the property for which the said Credit has been issued are surrendered under a trust receipt, collateral security satisfactory to the Company, such as stocks, bonds, warehouse receipts or other security, shall be given to the Company, to be held until the terms of the credit have been fully satisfied and subject in every respect to the conditions of this agreement.

It is further understood and agreed in the event of any suspension, or failure, or assignment for the benefit of creditors on *my* part, or of the nonpayment at maturity of any acceptance made by me, or of the nonfulfillment of any obligation under said credit or under any other credit issued by the ----- Trust Company ----- on *my* account, or of any indebtedness or liability on *my* part to you, all obligations, acceptances, indebtedness and liabilities whatsoever shall thereupon, at your option then or thereafter exercised, without notice, mature and become due and payable.

It is understood and agreed that you shall not be held responsible for the correctness or validity of the documents representing shipment or shipments, nor for the description, quantities or quality of the merchandise delivered thereon.

(signed) *John Jones & Co.*

FIG. 2.—AGREEMENT OF PURCHASER.

drafts against the letter of credit 12 days prior to their maturity in London, together with the banker's agreed commission; that they will insure the shipment for the banker's interest; that the title of the merchandise, bills of lading and insurance policies shall remain vested in the bank until all indebtedness is paid; that the bank is permitted to sell the merchandise for debt or for failure to supply security demanded in case the value of the merchandise falls; that the importer has the privilege of paying prior to maturity, interest being allowed at 1 per cent, under the Bank of England discount rate. The allowance of interest varies, and is a matter of agreement between banker and importer.

The letter of credit shown in Fig. 3 is issued and handed to the importer who in turn gives it to the representative of Wil-

SPECIMEN CREDIT *confirming cable.*

Credit No. 6743
£ 5,000

----- Trust Company -----
Foreign Department
New York, February 16th 1916.

Pay to the order of William Smith & Co.
Singapore, Straits Settlements

Beneficiary.

We hereby authorize you to value on the ----- Trust Company -----
London, for account of Messrs. John Jones & Co., New York
up to an aggregate amount of Five thousand pounds Sterling
available by your drafts at 90 (ninety) days sight
against shipment of Latex Rubber from Malaya, to the United States
Insurances excluding War Risk effected in New York

Bills of Lading for each shipment must be made out to the order of the ----- Trust Company
unless otherwise decided in this credit.

CONSULAR INVOICE AND BILL OF LADING MUST BE SENT BY THE BANK OF AMERICA NEGOTIATING
DRAFTS, DIRECT TO THE ----- TRUST COMPANY ----- NEW YORK, FOR ADVISE TO
TRUST COMPANY ----- LONDON.

The remittance documents must accompany the drafts drawn on ----- Trust Company
London.

The amount of each draft, negotiated, together with date of negotiation, must be endorsed on back
hereof.

We hereby agree with bona fide holders that all drafts drawn by virtue of this Credit, and in
accordance with the above stipulated terms, shall meet with due honor upon presentation at the Office of the
----- Trust Company ----- London if drawn and negotiated prior to July 2nd 1916

----- Trust Company -----

(Signed) R. S. Quayle - Vice President
(Signed) John Doe - Manager

N. B. Drafts drawn under this Credit must state
that they are "drawn under Letter of
Credit No. 6743
Dated February 16th 1916"

FIG. 3.—LETTER OF CREDIT.

liam Smith & Co. of Singapore. Being a cable credit, the bank issuing it cables the essential particulars to its Singapore correspondent either directly or via London. The Singapore bank then notifies William Smith & Co. of the issuance of the credit and they are free to make drafts against it under the conditions set forth in the credit.

It might properly be noted here that the letter of credit costs William Smith & Co. nothing at the time of issue, the bank receiving as remuneration a percentage of the amount of the draft actually drawn against the credit. John Jones & Co. pay this commission when they settle for the draft.

William Smith & Co. in the meantime are arranging for the shipment of rubber, which may be sent in one or two regular ways, according to the terms of purchase. One method is "f. o. b.," meaning free on board, or "c. i. f." (often pronounced "Siff"), the abbreviation for cost, insurance and freight. Large importers find as a rule at the present time that they can make more satisfactory purchases on the f. o. b. basis.

With bottoms scarce and freight high, sellers are not particularly anxious to go to the extra trouble and expense of c. i. f.

shipments even if remunerated for the cost. If the terms are f. o. b. all the seller has to do is to make delivery to the dock, secure the necessary papers and get his money. As this rubber is sold f. o. b., the shipper on delivery of goods to the dock pro-

SPECIMEN DRAFT

First

Singapore, 11th 25th February 1916

Ninety days after sight of this First of Exchange
(the First being unpaid/pay to the order of)

Pay to the order of William Smith & Co.
as advised

----- Trust Company -----
London & Co.

(Signed) William Smith & Co.

Second

Singapore, 11th 25th February 1916

Ninety days after sight of this Second of Exchange
(the First being unpaid/pay to the order of)

Pay to the order of William Smith & Co.
as advised

----- Trust Company -----
London & Co.

(Signed) William Smith & Co.

FIG. 4.—DRAFT.

cures steamer bill of lading showing consignment to the banker, and consular invoice from the American Consul.

He has nothing to do with the insurance in this case, because by the terms of the credit, insurance, including war risk, is to be effected in New York. Many New York importers place their own insurance in the form of a blanket policy or a special policy to cover each shipment, as they can usually obtain better rates here than in the Far East, being in close touch with both the New York and London companies.

All arrangements having been made, William Smith & Co. draw a draft in duplicate, as shown in Fig. 4 (without the "acceptance"), at 90 days' sight, and attach it to all documents, which are the consular invoice and all negotiable copies of the bill of lading, and if insurance is not covered in New York, the insurance policies or certificates, usually in duplicate.

Taking these to any local bank in Singapore that buys such drafts, the draft is sold at the prevailing rate of exchange for bankers' 90 days' sight drafts on London. The bank will, of

SPECIMEN ADVISE OF MATURITY

----- Trust Company -----
New York, April 3rd 1916

To Messrs. John Jones & Co.
New York City

Dear Sirs:

We have received from our London Office the following advices of maturity for your account:

| L/C No. | Name of Vessel | Foreign Currency | Due in New York | Due in London | Remarks |
|---------|----------------|------------------|-----------------------|-----------------------|---------|
| 6743 | Clarrway | £1763 11 6 | June 12 th | June 24 th | |

FIG. 5.—ADVISE OF MATURITY.

course, be particular to see that all documents conform in every particular with the terms of credit. William Smith & Co. thus receive their money, but neither John Jones & Co. nor the New

York bank have as yet advanced any payment in the transaction.

The bank at Singapore is required by the terms of the letter of credit to send one bill of lading together with consular invoice directly to the New York bank. The remaining documents, which include duplicate bills of lading and insurance certificate, if required, are attached to the original draft and sent forward to London by the Singapore bank.

As soon as the draft reaches the London correspondent of the Singapore bank its messenger takes it to the London branch of the New York bank, which accepts it by writing on the face the word "Accepted," the date of presentation and the date at which it matures, which is 93 days after the first presentation (three days of grace being allowed in London), and finally signing the acceptance officially. The London bank notifies its New York office of the amount of the draft and the date of its maturity, and forwards the shipping documents.

In the meantime the bill of lading and consular invoice have gone direct from Singapore to the New York bank, which holds them pending the arrival of the goods. On receipt of advice from London they advise John Jones & Co. of the date that the draft is due in London and also in New York. The form shown in Fig. 5 is used for this notification.

If John Jones & Co. should so desire, they may pay cash at any time before the draft is due and receive an allowance of interest, according to the agreement with the banker at time of issuance of the credit.

If this is not done the rubber is cleared and warehoused in the bank's name until the obligation is met.

By this method the importer is permitted to remove the rubber and sell it, but is bound to turn over immediately to the New York bank enough money coming from such sale or sales to pay the relative obligation to the bank. Furthermore the bank is privileged at any time to cancel the agreement and take over

| SPECIMEN STATEMENT | | | |
|--------------------------------------|--------------|---------------------|-----------|
| New York, June 13 th 1916 | | | |
| Memo John Jones & Co., New York City | | | |
| To ----- | | Trust Company ----- | |
| Foreign Department | | | |
| 66-6743 | \$1763 11/16 | @ 4821 | \$8500.43 |
| | | plus 1/4 % comm. | 63.75 |
| | | | \$8564.18 |
| We charge your account. | | | |

FIG. 7.—STATEMENT RENDERED.

the goods for which they have given their obligation. This trust agreement in no wise interferes with the obligation to meet the draft when due in New York.

The final form, illustrated in Fig. 7, is the statement rendered to John Jones & Co. on the date the draft is due in New York. The original amount drawn in Singapore is converted at the current selling rate of exchange for bankers' checks on London on the date the draft is due in New York. To this is added the commission, usually 1/4 to 1/2 of 1 per cent per month of the tenure of the draft. The total amount as shown by the statement is charged against John Jones & Co.'s account or they remit their check to the banker, and the transaction is ended.

This system of credits has been found to be a most logical and satisfactory way of financing imports, inasmuch as the importer has the assurance that the goods must be shipped before the seller receives payment, and the seller is sure of obtaining his money immediately on delivery of the goods to the steamship company.

The documents that are reproduced have been supplied through the courtesy of George Weston, manager of the Foreign Department of the Guaranty Trust Co. of New York, one of the largest and most prominent institutions in the commercial letter of credit business.

MACHINE FOR INFLATING TOY BALLOONS.

Toy balloons are made by the dipped process, that is, the small pear-shaped form is dipped into a solution of rubber, after which the balloons are vulcanized and finally inflated. It

is for the latter process the apparatus here shown is designed. The vessel on the right is the generator, and here hydrogen gas is generated by the action of sulphuric acid upon zinc, this gas being conveyed by a rubber tube to the vessel on the left, which is the gas reservoir. This is surmounted by a pipe with a stop-cock. The neck of the balloon is pressed over the end of this tube, the stop-cock turned on, the balloon inflated, the stop-cock closed; then the neck of the balloon is tightly wound with strong thread, after which it is varnished in the usual manner. Two sizes are made, one for inflating 8 dozen balloons at each charge, and the other for 12 dozen balloons. [Brazel Novelty Manufacturing Co., Cincinnati, Ohio.]



| SPECIMEN | |
|---|----------------------------|
| TRUST RECEIPT | |
| Received from THE ----- TRUST CO. ----- the following goods and merchandise, their property, specified in the Bill of Lading per S.S. "Cleary" Dated Singapore, February 23 rd 1916 marked and numbered as follows: | |
| WSC 1/70 | Seventy cases Grade Rubber |
| JSC | |
| and, in consideration thereof, [] HEREBY AGREE TO HOLD SAID GOODS IN TRUST for them, and as their property, with liberty to sell the same for their account, and further agree, in case of sale to hand the proceeds to them to apply against the acceptances of THE ----- TRUST CO. ----- on [] account, under the terms of the Letter of Credit No. 6743 issued for [] account and for the payment of any other indebtedness of [] to THE ----- TRUST CO. | |
| THE ----- TRUST CO. ----- may at any time cancel this trust and take possession of said goods, or of the proceeds of such of the same as may then have been sold, wherever the said goods or proceeds may then be found and in the event of any suspension, or failure, or assignment for the benefit of creditors, on [] part, or of the non-fulfillment of any obligation, or of the non-payment at maturity of any acceptance made by [] under said credit, or under any other credit issued by THE ----- TRUST CO. ----- [] account or of any indebtedness on [] part to them, all obligations, acceptances, indebtedness and liabilities whatsoever shall thereupon (with or without notice) mature and become due and payable. The said goods while in [] hands shall be fully insured against loss by fire. | |
| Dated, New York City April 3 rd 1916. | |
| (Signed) John Jones & Co. | |
| 1763 11/16 | ms. |

FIG. 6.—TRUST RECEIPT.

If the importer is of sufficiently good standing, the bank may permit the goods to be released on a trust receipt. One form of trust receipt is shown in Fig. 6.

The Trade Press and Our Present Problems of Business.

Extracts from a Notable Address by Edward N. Hurley, Vice-Chairman, Federal Trade Commission, Before the New York Trade Press Association.

IT affords me great pleasure to address that branch of the Fourth Estate which speaks directly to, and for, the manufacturers and business men of our great country. The trade journal, as the complement of the trade association, is an instrument in enforcing that collective effort which is an essential of modern industry; while the trade press as a whole is a prime factor in establishing fraternity among all groups of business men, and thus uniting them in the common work of achieving and maintaining national prosperity.

PREPAREDNESS, TRADE AND MODERN METHODS.

Industrial preparedness, foreign trade, and more efficient methods of manufacture seem to be the most important questions before the American people today. You are vitally concerned. Your trade papers are devoting pages to the necessity of improving conditions in our factories, for the purpose of getting our share of the trade in manufactured goods that are sold in foreign markets. There is no question that your efforts will be productive of results.

I sometimes wonder if the efforts of your editorial writers, and your technical experts, are appreciated by the average manufacturer engaged in the industry which the trade paper represents. I do know that any manufacturer or employer who does not read the trade paper representing the industry in which he is engaged is not keeping abreast with the times. It is impossible for him to know what his competitors are doing; what new development is being made in the improvement of his product; what progress is being made in new inventions and designs; and the factory or company that does not have numerous trade journals scattered through its plant, so that employees may read them and keep well informed, is not a very progressive concern.

THE STARTING POINT IN PUBLICITY.

Progressive business men realize that trade-journal advertising produces results. If a manufacturer or business man will first start advertising in his trade journals, and become educated to the advantage of good copy—paying special attention, of course, to reaching his dealer—his next step, if his product will warrant it, is a national advertising campaign; but the first step is his trade journal or business magazine.

ASSOCIATION WORK.

Trade associations that are putting forth a special effort to improve their systems of cost accounting, bettering their processes of manufacture, obtaining credit information, and endeavoring to improve the welfare of their employees, will be important factors in our country's development in the next few years. It is recognized that individual groups which are working intelligently through trade associations and trade journals, will embrace the industries that can compete in price and quality in the markets of the world.

All of us are talking a great deal these days about mobilizing American resources. Mobilizing means simply organizing to achieve a common purpose. Many manufacturers seem prone to associate mobilization with expansion; and I venture to suggest that you gentlemen of the trade press profitably may devote some attention to the psychology of this error, with a view to getting the true situation indelibly impressed on the minds of the man of the business world.

EXPANSION BY EFFICIENCY.

I hope, now that our business has become normal and our factories are running on full time, that our manufacturers will place capacity ahead of expansion. I hope that, instead of rushing to build additions to their plants, they will ascertain that their present equipment has reached the maximum of day work, and then develop the night shift so that every piece of machinery will be working to its limit. We have an example of what American manufacturers can do along this line in the automobile industry.

We should get away from that old-fashioned notion that the night crew is lacking in efficiency, and that its workmanship is not up to the standard.

THE CAPACITY PROBLEM.

There has been over-anxiety to enlarge our industrial plants before we have worked our present equipment to its capacity.

Consequently, when there is depression in business in this country, we have an overproduction for our home requirements, and, with no large foreign markets for our surplus of manufactured goods, we immediately start to cut prices on the plea that such action is necessary in order to keep our large plants running. This always results in a general demoralization of our industries.

If we can stop this overproduction of our industries we will have a surplus of money to invest in foreign countries, instead of having millions tied up in plants that are running three days a week to supply our domestic market, with no returns on the investment.

TODAY'S INDUSTRIAL PROSPERITY.

With present business and profits holding through this year our industrial concerns will reach that commanding position which is given by great and ready cash resources. Among some of our larger concerns this position already has been attained. The United States Steel Corporation began the present year with \$105,000,000 in cash. This largest of our industrial companies never before reported cash holdings in excess of \$68,000,000. Other concerns, especially those engaged directly in war business, have immense cash holdings.

Our industrial concerns, in short, are fast getting into condition to finance greater business than ever before, not only at home but abroad. They are getting to be able to make contracts, say, with South American countries, on a basis never before possible to Americans, and to do it without arranging with bankers in special ways.

FOR FOREIGN TRADE EXPANSION.

One of the commanding holds upon foreign trade which the German dyestuffs manufacturers had, before the war set a barrier against them, was their immense power in working capital, which enabled them to extend credits and to conduct all sorts of aggressive campaigns to get world business. We are getting into position to profit from this example. You are vitally interested in presenting to the practical business men who read your papers, facts and suggestions that will aid in getting the greatest possible profit out of the situation that is developing.

There is no question more interesting to ponder, at this time, in considering the betterment of business conditions, than that of foreign trade. It is a most important question to our country. Our mines and forests, and our factories are turning out products for which there is a demand abroad, and it is not merely a question of increasing this demand, but the question of creating conditions that will enable us to get good prices for our wares, and produce them at the lowest possible cost, that should particularly command our attention.

Conservation is the handmaiden of prosperity so far as our foreign trade is concerned. Right here I want to emphasize the fact that the owners of our vast natural resources are the trustees of the American people. You gentlemen of the trade press should make it ring in their ears like a cathedral chime. When they sell their products at ridiculously low prices, the lumber, the copper and the coal that come from nature's storehouses—they are violating their trust, for ruinous trade spells a waste that brings nothing in exchange. Let me call your attention to a few facts pertaining to our foreign trade in its relation to natural resources, and to facts concerning the methods that are employed by some of our competitors in the commerce of the world, to prevent waste.

FOREIGNERS CONTROL AMERICAN PRICES.

Frankfort-on-the-Main is the home of a combination of German metal buyers who control the world market for copper, lead, zinc, and various other metals. It is a family affair, and has subsidiary companies in England, France, Belgium, Switzerland, Australia, Africa, Mexico, and the United States. It owns zinc mines in Oklahoma, smelters in Colorado, and controls one of the greatest metal trading companies in New York City. This giant organization with its affiliations dominates the metal markets of the world. Time and again it has depressed the price of our copper. It is a notorious fact that it has compelled our producers to sell copper to foreign buyers at lower prices than to our home users. The combination has been able to do this in spite of the fact that this country sup-

plies two-thirds of the world's copper, and ought to set the prices, because it deals with our producers as individuals and plays one against the other.

We don't export much coal, but we sell a great deal to foreign ship-owners to bunker their vessels which call at our ports. At Newport News the Pocahontas and New River operators of West Virginia are dumping some of the finest coal in the world into foreign bunkers. The price is set for a year by a combination of English brokers. Last year it was \$3.30 per ton, but this year, in the face of rising labor costs, the combination was able to cut that price to \$3.10 because it could get certain mine operators to make low bids. When freight and other charges are deducted that nets \$1.38 to \$1.43 per ton at the mine, an average of 6 to 7 cents per ton under that charged our own manufacturers. And that advantage will be handed to foreign ship-owners on nearly 2,000,000 tons of West Virginia coal this year.

A LESSON IN CONSERVATION.

When conditions arise to threaten waste of the natural resources of our commercial rivals, prompt remedial measures are undertaken. Several years ago the German potash miners were competing between themselves and selling potash to foreign countries at a ridiculously low price. Finally they formed a cartel to regulate prices, and were encouraged by the German Government. After this cartel had been in existence for several years a difference of opinion developed and several members withdrew and started negotiations with American buyers for the sale of their potash. One of the largest opened up negotiations with Armour & Co., of Chicago, and a contract was made with this firm below the cartel prices. After the contract was sealed, signed and delivered, the German Government notified the independent potash producers that they would have to break the contract; that the prices quoted to Armour & Co. were too low; that while the individuals were the owners of the mine they were in reality the trustees for the German people, and that the selling of potash to American packers at the price quoted affected every man, woman and child in Germany; that when the potash was gone one of the most valuable resources for Germany's future was destroyed.

That is what Germany does with one of her natural resources. We have a precisely similar opportunity. Down in Tennessee and Florida, and out in the Rockies are the greatest known deposits of phosphate rock, a fertilizer material even more essential to general agriculture than is potash. We produce nearly half the world's output of phosphate rock, and 40 per cent of our production, made up of high grade, goes abroad, chiefly to Europe. Under normal conditions we send 1,000 tons to Germany every day of the year. Do we follow the wisdom of Germany, charging the prices we ought, and conserving our limited supply of this vital natural resource, so necessary to the future of our agriculture and the low cost of living here? You know the answer. We are selling the best we have as fast as we can at Europe's price.

There are many instances where foreign nations have taken governmental action to prevent waste of natural resources. Italy thus saved its sulphur industry in Sicily from ruin, threatened by overproduction and unbridled competition. Rumania has safeguarded its rich oil fields in the same way.

OUR DISADVANTAGE EITHER WAY.

The outstanding fact that confronts us is this: When we buy abroad we are at the mercy of the foreign seller, and when we sell abroad we are at the mercy of the foreign buyer. In the language of the street, they "get us a-comin' and a-goin'." And the reason is that the European industries are organized scientifically to capture foreign trade and to get all there is out of it, while we in America have suffered the consequences of this one-sided organization.

Our method of disposing of our natural products, containing our valuable raw materials, and constituting the chief wealth of our country, should be stopped by the adoption of some practical, reasonable business method. For every dollar's worth of additional wealth that we receive for these products, the people of the United States profit, and when we do not receive a fair price for the products that we ship abroad we are impoverishing our people, and our country is that much poorer.

AMERICA'S CHANCE AFTER THE WAR.

Competition is the same the world over, and it will be particularly keen when the business of peace is resumed among the nations. America's chance at the trade of the world will be helped beyond what it was before by reason of a new, even start with the others in the race, but we must be prepared to match systematized industry against the effective systematized

industries of our competitors. We must meet conditions as they exist.

In European countries manufacturers and merchants, aided by their governments, have developed a high state of efficiency, which enables them to sell their goods in the markets of the world. Our buyers, seeking raw and finished materials in foreign countries, who formerly had a free competitive field from which to receive bids, now find that the great manufacturing industries have been formed into combinations or cartels; and, instead of receiving bids from several concerns, the American buyers now have to do business with central selling agencies, each representing a whole industry. But when the foreign buyer seeks material here he finds our unsystematized market—much to his own satisfaction.

If the American manufacturer and merchant are forced to purchase their materials abroad at a higher price because of the elimination of the old competitive system, is it fair that our business men engaged in the foreign trade should be subjected to the ruinous features of the old system here at home? When the foreign buyer seeks material here he has hundreds of firms to bid on his order. When the first bid is received, back comes the cable: "Your price is too high." Then our business men start to cut prices in their endeavor to get the order, particularly if domestic business is dull. And so, instead of setting a fair price on his product and selling at a profit, the American business man takes what the foreign buyer dictates, frequently at an actual loss.

WORK OF THE FEDERAL TRADE COMMISSION.

The Federal Trade Commission will have a report ready in the next few weeks to submit to Congress showing further facts regarding our foreign trade conditions.

It is my belief that the time has arrived for some definite concrete action, and I feel confident that the sentiment is most favorable for some practical immediate relief.

Within the next few weeks the commission will mail to each corporation in the United States a letter and a list of questions, and the success of our efforts will in a measure depend upon you gentlemen. We are going to mail each trade paper in the United States a copy of this letter, as well as the questions, and we would like very much to have each trade paper endorse and urge the business men in their industry promptly to fill out the form and send it to the Federal Trade Commission. I wish particularly to call your attention to the fact that we are compiling this information for the business men engaged in every industry, and that our whole thought is to do the work in a manner that will be helpful to all.

A SERVICE TEST.

Electric storage battery jars must be made of an extremely tough compound to stand hard usage without breaking.

Storage batteries are now used by thousands of electric, pleasure and commercial vehicles. Storage batteries are hauling coal from the mines, lighting railway trains, operating railway switches and signals; indeed they are now used in every field of electrical development.

In the illustration an "Exide" hard rubber jar is shown supporting a 217-pound man, who holds a complete "Exide" baby battery of 48 pounds in his hands. This jar, while badly bent by the weight of 265 pounds, was not broken or cracked. It was taken from stock to demonstrate the extraordinary strength, toughness and flexibility of "Exide" hard rubber storage battery jars.—[The Electric Storage Battery Co., Philadelphia, Pennsylvania.]



Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

Machines For Making Bathing Caps.

THERE was a time when the bathing cap was plain and unattractive. Today it is made in a score of shades and shapes, and so beruffled and trimmed that it is a most attractive part of the bathing costume.

These changes have turned the old-time hand process work into a line of rubber manufacture for which a number of labor saving machines have been designed. The present day processes begin, of course, with the preparation of the stock.

First, latex plantation rubber is massed and mixed with the desired dry aniline color, be it yellow, orange, red, violet, blue or green.

It is here that the scarcity of imported dyes has seriously affected the industry. Most of the brilliant colors formerly came from

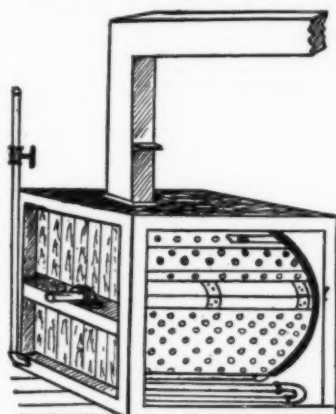


FIG. 1.—ROTARY VAPOR VULCANIZER.

Germany, and are therefore not obtainable. However, satisfactory results are attained by proofing both sides of bright colored plaids, figured poplins, taffetas and crepe de chins, with a transparent coating of pure rubber. Indeed, beautiful effects are thereby obtained, and it is further true that the colors will not run.

The rubber stock is next calendered and dusted with corn starch. It is then cut into 25-foot lengths, which are laid on a smooth surfaced shrinking table, one upon the other for a period of 48 hours. Whether the material from which the caps are to be made is calendered sheet or waterproofed cloth, the following methods of manufacture are practically identical in both cases.

The metal patterns for the bathing cap body are 18, 19 and 20 inches in diameter. When the shrinking is complete the pattern is laid on the sheet and the body of the cap cut out by hand.

The edges of the cap body are then "hemmed." This operation is performed on an ordinary sewing machine, but without needle or thread, the hemming device simply folding over the edges of the cap body while the feed and the presser foot solidly unite them.

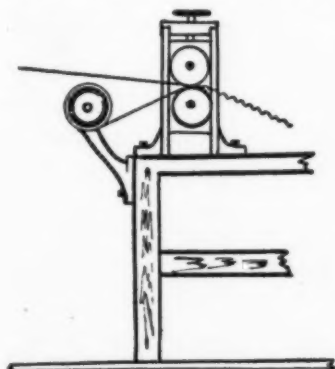


FIG. 2.—HEAD-BAND RUFFLING CALENDER.

Up to this point the work has been with soft, uncured rubber that requires careful handling as it is easily distorted and damaged, besides being sticky. As the operations that follow require a certain amount of firmness in the material, this quality is obtained by semi-curing the rubber in the rotary vapor vulcanizer shown in Figure 1. This is a box-like chamber heated by steam coils and enclosing a belt-

driven perforated wooden cylinder. In this the cap bodies are tumbled for an hour at a temperature of 110 degrees F., and exposed to monochloride of sulphur vapor, which effects a semi-cure.

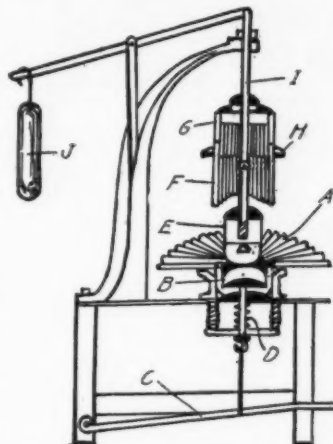


FIG. 3.—PLEATING AND FORMING MACHINE, OPEN.

wider than the upper one, and is unvulcanized, while the narrower, upper strip is semi-cured. In this position they are fed to the small 2-roll calender shown in Figure 2, meanwhile the operator pulls on the elastic upper strip, thereby ruffling the lower uncured strip as it passes between the rolls. The inside head-band is a plain strip of unvulcanized rubber about $\frac{3}{8}$ inch wide.

The cap is formed and the lower part pleated on a machine especially designed for this purpose. Before this is done the points of the pleats, where they will come in contact with the inside and outside head-band, are brushed with cement made of pure rubber dissolved in naphtha, and allowed to thoroughly dry.

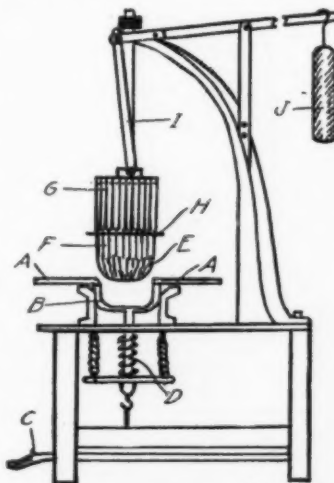


FIG. 4.—PLEATING AND FORMING MACHINE, CLOSED.

the head-block E and the ends joined, making the band endless. The upper pleating blades F, 36 in number, are arranged in circular form around the flange G, and turn on their vertical axes when the ring H is partly revolved. They also alternately register with the lower blades. The upper blades are then

Making the inside and outside head-band and the ruffled trimming that forms part of the latter is the next step to be considered. The unvulcanized sheet, that has been previously dusted with corn starch, is rolled on a mandrel, which is placed in a speed lathe, and the head-band strips are cut into separate rolls of the proper width. The edges of the band strips are folded by passing through metal folders. The lower strip forming the ruffled part of the outside head-band is

The next step in the operation is pleating, forming and assembling, which is done on the machine shown on Figure 3. The round semi-vulcanized and cemented cap body is placed evenly on the lower folding blades A. These are 36 in number, and arranged in circular form with their inner ends pivoted to the hollow plunger B that is reciprocated vertically by action of the treadle C and coil spring D. The inside head-band, which has been previously brushed with cement, is placed around

lowered by depressing the vertical shaft *I*, controlled by the counter-weight *J*, until the blades are 3 inches below the inside cap-band that is attached to the head-block. The foot is then placed on the treadle, which lowers the hollow plunger and forces the lower pleating blades upward. These accurately fold the rubber sheet between the upper blades, and firmly attach each pleat to the inside head-band. The treadle is then released, allowing the lower blades to fall back and resume their original posture, as illustrated in Figure 4.

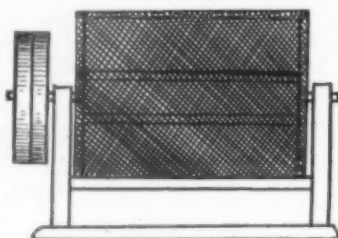


FIG. 5.—DRYING TUMBLER.

The cemented part of the cap has now been folded on and over each one of the upper blades, and cemented fast to the inside

head-band. The ring to which the blades are attached is moved to the right, which simultaneously folds the pleats one upon the other, after which the blades are released by raising the upper blade-head. The outside head-band and trimming is then attached, and the cap and head-block are removed from the machine. An operator with ordinary intelligence and a little experience can turn out one complete cap a minute on this machine.

The final cure is then given, which is tumbling for 60 minutes at 110 degrees F. in monochloride of sulphur vapor in the vulcanizing chamber already described. The washing process which follows is performed in an ordinary rotary washing machine common in every steam laundry. Cold, clear water, with a small amount of 26 degrees liquid ammonia, and a pint of neutral chip soap serves to remove the corn-starch from the caps and restore the original brilliant colors. The final drying is done in a rotary octagon tumbler covered with open mesh wire cloth, as shown in Figure 5. About one hour's tumbling in this machine is sufficient to thoroughly dry the finished caps.

Foreign Import Duties on Rubber Tires.

THE following table, corrected to February 7, shows the foreign import duties on rubber tires of all descriptions imported into various countries from the United States.

The column marked "Weight" shows whether duties are levied on net or gross weight, or include simply the inner packings. The next two columns give the rate of the duty per 100 pounds in United States currency and the rate per cent ad valorem.

In the last column are given many valuable notes regarding imports into particular countries.

Certain charges such as warehousing, customs handling, local taxes, revenue stamps, etc., are not included. The rates of duty shown, including the surtaxes as noted, should therefore be regarded as the minima. As changes in duties are liable to occur at any time, frequent verification of these figures is advised.

| COUNTRIES. | Weight. | Rate per 100 Pounds, U. S. Currency. | Rate Per Cent.— Ad Valorem. | Remarks. |
|---------------------------------|---------|---|-----------------------------------|--|
| NORTH AMERICA: | | | | |
| Canada ..... | ..... | ..... | 42.5 | { Imports of articles invoiced at prices less than the market value in the country from which exported, are liable to a "dumping" duty of 5 per cent if such articles are also made in Canada. |
| Central America: | | | | |
| British Honduras | Gross | ..... | 15 | { In addition, there is a wharfrage tax of 10.5 cents per 100 pounds. |
| Costa Rica: Port Limon | Gross | \$4.43 | ..... |  |
| Other ports | Gross | \$4.30 | ..... | { A surtax of 18.6 per cent is included. |
| Guatemala | Gross | \$7.21 | ..... |  |
| Honduras | Gross | \$4.86 | ..... | { A surtax of 10 per cent is included. The value of the Mexican peso, used in getting the converted value, was \$0.156. |
| Nicaragua: | | | | |
| Atlantic ports—Auto tires | Gross | \$3.81 | ..... | { A surtax of 10 per cent is included. The duty was based on the Mexican peso, used in getting the converted value, was \$0.156. |
| Solid tires | Gross | \$2.86 | ..... |  |
| Motorcycle tires | Gross | \$5.72 | ..... | { A surtax of 10 per cent is included. |
| Pacific ports—Auto tires | Gross | \$4.08 | ..... |  |
| Solid tires | Gross | \$2.99 | ..... | { A surtax of 10 per cent is included. |
| Motorcycle tires | Gross | \$12.25 | ..... |  |
| Panama ..... | ..... | ..... | 15 | { A surtax of 10 per cent is included. The value of the Mexican peso, used in getting the converted value, was \$0.156. |
| Salvador | Gross | \$13.65 | ..... |  |
| Mexico—Tires | Net | \$5.16 | ..... | { A surtax of 10 per cent is included. |
| Inner tubes | Net | \$3.53 | ..... |  |
| Newfoundland ..... | ..... | ..... | 49.5 | { A surtax of 10 per cent is included. |
| West Indies: | | | | |
| British— | | | | { Cost of packing is excluded. |
| Antigua ..... | ..... | ..... | 13.33 | |
| Bahamas ..... | ..... | ..... | 22 | { A surtax of 10 per cent is included. |
| Barbados ..... | ..... | ..... | 11.25 | |
| Dominica ..... | ..... | ..... | 12.5 | { Cost of packing is excluded. |
| Grenada ..... | ..... | ..... | 10 | |
| Jamaica ..... | ..... | ..... | 16.67 | { Cost of packing is excluded. |
| Montserrat ..... | ..... | ..... | 13.33 | |
| St. Christopher-Nevis ..... | ..... | ..... | 11 | { Cost of packing is excluded. |
| St. Lucia ..... | ..... | ..... | 16.5 | |
| St. Vincent ..... | ..... | ..... | 15 | { A surtax of 10 per cent is included. |
| Trinidad and Tobago ..... | ..... | ..... | 10 | |
| Turks and Caicos Islands ..... | ..... | ..... | 10 | { A surtax of 20 per cent is included. |
| Virgin Islands ..... | ..... | ..... | 10 | |
| Cuba ..... | ..... | ..... | 25 | { A surtax of 10 per cent is included. |
| Danish— | | | | |
| St. Croix ..... | ..... | ..... | 12.5 | { Duty, based on invoice price, increased 25 per cent. |
| St. Thomas and St. John ..... | ..... | ..... | 6 | |
| Dominican Republic | Net | \$36.29 | ..... | { Duty, based on price F. O. B. at port of export. |
| Dutch ..... | ..... | ..... | 3 | |
| Haiti ..... | ..... | ..... | 29.1 | { A surtax of 94.53 per cent is included. The duty was based on the import price + 10 per cent to allow for freight and insurance. |
| SOUTH AMERICA: | | | | |
| Argentina—Tires and tubes ..... | ..... | \$10.51 | ..... | { Weight includes inner packing. Automobile tires only. A surtax of 2 per cent is included. |
| Bolivia | Gross | \$20.29 | ..... |  |
| Brazil ..... | ..... | \$10.71 | ..... | { A surtax of 15 per cent and also a statistical tax of one-tenth of 1 per cent of the valuation are included. |
| | | | | { A surtax of 2 per cent is included. The conversion into U. S. currency is made on the basis of \$245 to the milreis. |

| COUNTRIES. | Weight. | Rate per 100 Pounds. U. S. Currency. | Rate Per Cent.— Ad Valorem. | Remarks. |
|-----------------------------------|---------|--|-----------------------------------|--|
| SOUTH AMERICA: | | | | |
| British Guiana | | | 18.15 | { This rate includes 10 per cent surtax, but for articles subject to specific rates only 5 per cent surtax is added, making the rate 17 1/3 per cent. Including inner packing. |
| Chile—Pneumatic tires ..... | ..... | \$39.74 | ..... |  |
| Solid tires ..... | ..... | \$19.87 | ..... |  |
| Colombia | Gross | \$0.93 | | { A surtax of 2 per cent is included. Articles imported by way of Buena-ventura and Guapi pay only 95 per cent of the duty, while those imported through Tumaco pay only 70 per cent of the duty during 1916. |
| Ecuador ..... | ..... | \$9.96 | ..... |  |
| Paraguay | | \$36.77 | | { A surtax of 125.5 per cent is included and the weight includes inner packing. Automobile tires only. A surtax of 7 per cent is included. |
| Peru—Automobile tires | Gross | \$24.28 | ..... |  |
| Other tires ..... | ..... | \$36.42 | ..... |  |
| Uruguay | Gross | | 39.5 | { A surtax of 8.5 per cent is included, but the license fee of .15 per cent and the statistical tax of .35 per cent of the valuation of all goods are not included. |
| Venezuela | Gross | \$10.28 | ..... |  |
| EUROPE: | | | | |
| Austria-Hungary | Net | \$13.81 | | { This rate includes 10 per cent surtax, but for articles subject to specific rates only 5 per cent surtax is added, making the rate 17 1/3 per cent. Including inner packing. |
| Belgium—Solid tires | Net | \$5.69 | ..... |  |
| Auto tires | Net | \$10.16 | ..... |  |
| Inner tubes | Net | \$14.88 | | { A surtax of 20 per cent is included. |
| Bulgaria—Tires and tubes | Net | \$5.25 | ..... |  |
| Denmark—Auto tires | Net | \$6.08 | ..... |  |
| Solid tires | Net | | Free | { A surtax of 3 per cent is included. Casings only. |
| Finland | Net | \$9.55 | ..... |  |
| France—Auto tires and tubes | Net | \$13.13 | ..... |  |
| Motorcycle tires | Net | \$21.89 | | { This duty is exclusive of the 4 per cent. tax which the various municipalities are authorized to impose. |
| Germany | Net | \$6.48 | ..... |  |
| Greece | Net | \$1.03 | ..... |  |
| Iceland | | \$0.24 | | { Conversion to U. S. currency is based on the average quotation of the paper milreis for July 1914. |
| Italy—Tires and tubes | Net | \$5.25 | ..... |  |
| Netherlands ..... | ..... | 5 | ..... |  |
| Norway | Net | \$3.65 | | { Weight includes inner packing. A tax of .5 per cent is included. |
| Portugal | Net | \$2.13 | ..... |  |
| Roumania ..... | ..... | \$9.06 | ..... |  |
| Russia | Net | \$32.09 | | { Automobile tires only. |
| Servia | Net | \$10.51 | ..... |  |
| Spain—Solid tires | Net | \$17.51 | ..... |  |
| Casings and inner tubes | Net | \$23.64 | | { The basis of this duty is the wholesale cash price in bond, less trade discount at the port of entry. |
| Sweden—Auto tires | Net | \$14.59 | ..... |  |
| Solid tires | Net | \$9.73 | ..... |  |
| Switzerland | Gross | \$0.70 | | { See note for Ceylon. |
| Turkey ..... | ..... | 30 | ..... |  |
| United Kingdom ..... | ..... | 33.33 | ..... |  |
| ASIA: | | | | |
| British— | | | 5.5 | { The basis of this duty is the wholesale cash price in bond, less trade discount at the port of entry. |
| Ceylon ..... | ..... | ..... | Free | |
| Federated Malay States ..... | ..... | ..... | Free | |
| Hongkong | | | 5 | { Automobile tires only. |
| India ..... | ..... | ..... | Free | |
| Straits Settlements ..... | ..... | ..... | 5 | |
| China | | | 8 | { Duties are based on the current import value. |
| Chosen (Korea) ..... | ..... | ..... | 10 | |
| Dutch East Indies ..... | ..... | ..... | 10 | |
| French Indo-China | Net | \$13.13 | | { Duties are based on the fair market value of the goods in the country from which exported. |
| Japan (including Formosa) | Net | 25 | ..... |  |
| Persia ..... | ..... | 10 | ..... |  |
| Siam | | 3 | | { Duties are based on the current value for home consumption at the place of purchase, including value of packing and the agent's commission if it exceeds 5 per cent. |
| AFRICA: | | | | |
| Abyssinia | | | 10 | { The dutiable value of imports is taken to be the cost price with charges, increased by 5 per cent or the invoice price without charges, increased by 15 per cent. |
| Belgian Kongo ..... | ..... | ..... | 10 | |
| British— | ..... | ..... | 12 | |
| Mauritius | | | Free | { At Alexandria an additional tax of .5 per cent is added, while different additional taxes are imposed at other ports. |
| Nigeria ..... | ..... | ..... | Free | |
| Union of South Africa | Gross | ..... | 15 | |
| Zanzibar | | | 7.5 | { Duties are based on fair market value F. O. B. at port of export, plus 10 per cent. On casings weighing over 2 3/4 pounds and inner tubes over 1 pound each, 36 cents per pound, if higher than the ad valorem rate. |
| Egypt ..... | ..... | ..... | 8 | |
| French Algeria | Net | \$13.13 | ..... |  |
| Italian— | | | 8 | { Imports of foreign origin are taxed 25 per cent of their value. |
| Eritrea ..... | ..... | ..... | 11 | |
| Libia ..... | ..... | ..... | 15 | |
| Somaliland | | | 12.5 | { Duties are based on the fair market value of the goods in the country from which exported. |
| Liberia ..... | ..... | ..... | 12.5 | |
| Morocco ..... | ..... | ..... | 12.5 | |
| OCEANIA: | | | | |
| Australia | | | 25 | { Duties are based on the fair market value of the goods in the country from which exported. |
| Philippine Islands ..... | ..... | ..... | Free | |
| New Zealand ..... | ..... | ..... | 1 | |
| Tutuila | | | 10 | |

What the Rubber Chemists Are Doing.

EXPERIMENTS IN VULCANIZATION.

NITROGEN and the rate of vulcanization of rubber has been studied by J. Grantham, who presents his results in the "Agricultural Bulletin" of the Federated Malay States (October, 1915). The investigation was conducted on several slices of smoked and unsmoked plantation rubbers representing conditions of standard practice in the preparation of rubber from its latex.

Although there is a wide difference in rate of vulcanization between smoked slab and smoked sheet, no difference is noticeable in the nitrogen content. Comparison of the unsmoked sheet and unsmoked slab showed that low nitrogen is connected with rapidity of vulcanization.

These observations were confirmed by a second series of experiments which yielded the following results:

| Type of Rubber. | Percentage of Nitrogen. | Optimum Time of Vulcan- ization in Hours. |
|---------------------------|----------------------------|---|
| Thick smoked slab..... | .425 | 1½ |
| Thin smoked slab..... | .398 | 1¾ |
| Thick smoked sheet..... | .400 | 2½ |
| Thin smoked sheet..... | .416 | 3 |
| Thick unsmoked slab..... | .210 | 1¼ |
| Thin unsmoked slab..... | .352 | 1½ |
| Thick unsmoked sheet..... | .386 | 2¼ |
| Thin unsmoked sheet..... | .394 | 3 |

All estimates were made on the crêpe prepared prior to vulcanization. Again no relation can be traced between the nitrogen content and rate of vulcanization in the smoked rubber, and the differences are probably experimental errors. The unsmoked rubbers, however, show a regularly increasing percentage of nitrogen, with a decreasing rapidity of vulcanization. The increase is not regular, however, the difference in nitrogen percentage between the two unsmoked slabs being much the greatest.

The loss of nitrogen in the unsmoked rubber is probably due to decomposition of the protein, and the rapidity of vulcanization appears to be associated with this decomposition. As far as the author is aware this relation between rapidity of cure and low nitrogen content has not been recorded before, probably on account of the predominance of smoked rubbers and crêpes on the market, in which the relation is not apparent. Smoking has the effect of preventing the loss of nitrogen. It does not, however, prevent a slab rubber developing a rapid rate of vulcanization since the smoked slab cures in 1½ hours. Hence it cannot be the actual loss of nitrogen which produces rapidity of vulcanization.

Experiments to determine at what stage in the preparation of slab rubber the nitrogen is lost showed that a large loss occurs when the slab is crêped previous to vulcanization. It also appeared that most of this nitrogen is in such a form in unsmoked slab that it is lost in the gaseous form when heated to 212 degrees F.

Other experiments were carried out with fresh coagulum. These showed a large loss of nitrogen during the drying of the slab. This is accounted for partly by the loss in the serum which drains away, and partly by the loss in the gaseous form due to decomposition.

The author summarizes his results as follows:

In smoked rubbers from the same latex the nitrogen content is constant, although the rate of vulcanization varies considerably between slab and sheet. Smoking appears to fix the nitrogen.

In unsmoked rubbers from the same latex there is considerable

variation in the nitrogen content of the rubber after crêping preparatory to the vulcanization process. It is small in the case of rapidly vulcanizing rubbers, and larger in that of the more slowly vulcanizing ones.

The low percentage of nitrogen in rubber prepared as unsmoked slab is attributed partly to loss in the gaseous form during the superficial drying of the slab, and partly to the washing out of nitrogenous decomposition products when the slab is crêped prior to vulcanization.

Since rapidly vulcanizing smoked slab rubber contains as high percentage of nitrogen as slowly vulcanizing sheets, the actual loss of nitrogen cannot be the cause of rapidity of vulcanization, although it would appear from the results of the unsmoked rubbers that rapidity of vulcanization and loss of nitrogen are in some way associated.

SYNTHETIC RUBBER AND SAWDUST.

In a recent number of "Le Caoutchouc & la Gutta Percha," G. Noyer reviews the work of Harries and other investigators on the relation between levulic acid and rubber, and the value of sawdust as a source of levulic acid. Harries has shown that the ozonide of rubber yields levulic acid by the action of water.

No satisfactory source has yet been discovered that will yield levulic acid in abundant quantity and at low cost. The author considers it possible that an abundant cheap source of levulic acid may be found in sawdust, and that the alcohol to be derived would pay the cost of treatment. It has been estimated that a ton of sawdust will give by Simousen's method, dilute sulphuric acid at 8 atmospheres, 250 kilos of levulic acid.

It is possible from levulic acid to derive isoprene; consequently it will furnish a synthetic rubber identical with natural rubber, and not one with unknown properties.

VULCANIZING EXPERIMENTS.

Eaton and Grantham have shown (THE INDIA RUBBER WORLD, March, 1916, page 289) how a particular method, which normally produces a uniform rubber with a very slow rate of cure and inferior mechanical properties, can be altered so that a rapidly curing rubber may be obtained possessing considerably superior physical properties after vulcanization, equal in fact to the best samples of First latex rubbers. This is accomplished by allowing the coagulum to remain for about ten days before it undergoes the usual procedure for conversion into block. Experimental results show that the rate of cure increases till the sixth day, after which little or no change takes place. It has been established that it is perfectly safe to crêpe the slab after ten days, since the change causing maximum rate of cure is effected during this period. Examination of several old samples of slab rubber indicate that the substance causing this acceleration in rate of cure does not apparently decrease.

DETERMINING PROTEINS IN RUBBER.

A convenient method for the separation of the nitrogenous bodies contained in rubber has been perfected by Spence and Kratz.

A solution of rubber in benzene, chloroform or toluene when treated with acid loses viscosity. The decrease may reduce the viscosity to that of the solvent. At the same time the insoluble nitrogenous compounds in the rubber are precipitated and readily separated. The reaction is hastened by sunlight or heat. The method has been applied to determinations on plantation and hard cure Para rubber. The results appear to demonstrate that the insoluble nitrogenous residue found in rubber is not pure protein, but a complex of protein and carbohydrate, probably a gluco-protein. The work of Spence and Kratz indicates

that the correct factor for calculating the protein content of plantation and wild Para rubber is 10 rather than 6.25, which has previously been taken.

The process of isolating the nitrogenous composites of rubber also permits their further study and analysis.

The details of the method are thus stated: 100 grams of washed and dried rubber are treated with 1,000 cc. of benzene containing from 0.3 to 0.5 per cent of trichloroacetic acid. The mixture is exposed to sunlight or heated in a vessel immersed in boiling water and thoroughly shaken at intervals. After 48 hours the solution is allowed to settle and the clear liquid decanted. The insoluble is subjected to two extractions, 500 cc. each, of the mixture of benzene and trichloroacetic acid. The residue is washed with pure benzene, dried, powdered and again extracted with benzene. Following this it is washed with alcohol, dried and weighed.

THE STRUCTURE OF RUBBER.

In "Le Caoutchouc & la Gutta Percha" (February 15, 1916) André Dubosc discusses at length the various theories of the structure of the rubber molecule and its attachments in the complex rubber agglomerate. The author recognizes the extreme difficulty of the problem, and reviews impartially the work of the eminent chemists who have investigated the subject. He presents a concise discussion of the leading theories, as analyzed by the Russian chemist Koudhakow, and sustains the theory of Barrow as the best thus far advanced.

Barrow holds that no formula of the constitution of rubber can be admitted unless it is compatible with the following experimentally demonstrated facts:

1. Rubber gives, by action of ozone, an ozonide which results from the addition of O^3 to a product of depolymerization.
2. Rubber, treated with bromine, gives a tetra bromide, which is an addition product.
3. Rubber, heated in high boiling point solvent, depolymerizes, not to a cyclooctadiene, but to dipentene containing a cycle in C^8 .
4. Rubber subjected to pyrogenation gives a series of products of decomposition.
5. Rubber, by hydrogenation, changes into a saturated carbide.
6. Rubber can be obtained by polymerization from isoprene, whereas the dipentene does not give rubber.
7. Rubber, left to itself, passes by a superior degree of polymerization, this process being reversible.
8. A small quantity of sulphur is sufficient for complete vulcanization.

Barrow proposes a very ingenious formula, which practically harmonizes the ideas of Harries and Pickles. This he has done by the conception of a spiral formula for the rubber complex, with double connections mutually saturated. The diagrams (here omitted) show that such a spiral molecule would be in close relation with that of the cyclooctadiene, since the double connections are in the same situation.

Harries' formula explains the rubber molecule, but is vague regarding complex or polymerized rubber.

Barrow's spiral formula scheme supplements Harries' theory by uniting and explaining the reactions that have been experimentally noted concerning rubber, and gives the best idea of what the structure of rubber may be, notwithstanding certain obscure points and the difficulty of comprehension that the scheme involves.

ACETONE SUBSTITUTE.

Solvent mixtures containing ethyl alcohol, ethyl acetate and formic ethers have been proposed in place of acetone for the treatment of resinous rubbers by extraction. The presence of a large amount, 40 per cent, of ethyl acetate in such a solvent serves to hold considerable of the rubber in solution. This action is aided by the heat, which increases the reaction of the acetic and formic ethers upon the rubber. The solution thus

formed can only be precipitated by the addition of a large quantity of ethyl alcohol.

The use of such acetone substitutes is not economical, and can not be recommended. (G. Noyer in "Le Caoutchouc & la Gutta Percha.")

A NEW METHOD OF COAGULATION.

Eaton and Grantham, chemists of the department of agriculture of the Federated Malay States, have published in the "Bulletin" (November, 1915) an account of their experiments on the coagulation of Hevea latex and a new method of coagulation:

"If Hevea latex be allowed to stand in open vessels, the amount of coagulation depends on the shape of the vessel and the depth of the latex. A thin layer of latex does not coagulate, but changes to a peculiar slime with a yellow surface scum. If latex be placed in tall cylinders, coagulation is much more complete and the slime formation is much less, constituting only a small depth of the latex near the surface. The surface scum is also found to be alkaline in character and the scum below acid, showing two distinct processes of decomposition. This is the basis of the so-called "anaerobic" process of coagulation for which a patent has been taken out in the Federated Malay States. This process may thus be explained by a bacterial theory. The conditions are such as to inhibit a large number of bacterial species, including most of the putrefactive ones, while other species, including the coagulating ones, free from the competition of purely aerobic species, are encouraged. To find an explanation on the enzymic hypothesis is more difficult. We have since found that coagulation under these conditions is variable, on some days the coagulation being complete and on other days not quite complete, indicating a variable factor in the latex itself."

A series of experiments was conducted in which the effect of putrefactive and non-putrefactive changes in the latex was studied. Treating latex with various antiseptics and heat delayed or prevented coagulation.

The authors summarize their experimental results as follows: "These experiments indicate a possible explanation of the natural coagulation of the latex of *Hevea Brasiliensis*, viz.: That it is due to certain bacteria which infect the latex after collection.

"There are two distinct types of organisms, one favored by aerobic conditions, which tends to inhibit coagulation and produces an alkaline slime in the presence of air, and the other favored by anaerobic conditions which affect the coagulation of the latex.

"The coagulation of latex under anaerobic conditions is not constant; on some days complete coagulation occurring, and on other days being much less complete, possibly due to a variation in the constituents of the latex.

"By the addition of various sugars, coagulation under both aerobic and anaerobic conditions always occurs, and is caused, in our opinion, by the fact that a medium is formed more favorable for the organisms which produce coagulation, and less favorable to those producing putrefactive changes."

ANALYTIC METHOD.

DETERMINATION OF TOTAL CHLORINE IN RUBBER SUBSTITUTE.—The method of A. Hutin is as follows: From 0.2 to 0.5 grams of the substitute is covered in a porcelain crucible with the usual mixture of sodium carbonate and potassium nitrate. The mixture is heated slowly to quiet fusion. When cold the melt is dissolved in water to which nitric acid has been added, and the chlorine determined by titration.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

CHEMICAL TREATMENT OF RUBBER.

THE UNITED STATES.

RESTORING RUBBER. United States patent No. 1,172,158. Frederick Moench. The process consists in heating the vulcanized old rubber waste in a closed retort out of contact with the air, while enveloped with a plastic mixture containing linseed oil, turpentine and an earthy material.

RUBBER LEATHER SUBSTITUTE. United States patent No. 1,174,734. Benjamin Kepner. The process comprises treating a fabric with a solution composed of glycerin, gelatin, an oil and tannin, and thereafter drying the fabric in sunlight at a temperature not over 120 degrees F. The softness and flexibility of the product is increased by treatment with water and applying oil to the surface of the goods.

VULCANIZABLE SUBSTITUTE FOR LEATHER AND RUBBER.—United States Patent No. 1,174,967, John Stewart Campbell. The process consists in cooking a mixture of finely divided leather and animal fats or fatty oils with caustic alkali, adding fibrous material, magnesia, a filling material, and solution of elastic gum during progress of the boiling of the mass. After removal from the boiler the mass is dried and milled on rollers, with the addition of a vulcanizing agent. The product is formed into sheets and subjected to a vulcanizing operation.

THE UNITED KINGDOM.

COAGULATION OF LATEX. 22,138 (1914), S. C. Davidson. Rubber latex is coagulated by adding an "alkalized" cresol, cresylic acid or higher tar acids, or other "alkalized" phenoloid, and an aqueous solution of a thiosulphate, sulphite or other compound capable of evolving sulphurous acid on treatment with acid or acid substance, and finally coagulating by adding an acid or acid substance to liberate the preservative substance in the phenoloid, and also to liberate sulphurous acid. (Compare United States patent No. 1,145,351 and 1,146,851, THE INDIA RUBBER WORLD, September, 1915, page 648.)

TRADE PUBLICATIONS ON LABORATORY APPARATUS AND SUPPLIES.

GENERAL LABORATORY APPARATUS AND SUPPLIES. Lenz & Naumann, Inc., New York City. This is a new well-indexed catalog of 499 pages, in which all the well-known standard apparatus, as well as many specialties are illustrated and described. The lines carried include chemical, medical, surgical and physical apparatus, glassware, specialties and chemicals.

VITROSIL. The Thermal Syndicate, New York City. Pure fused silica in numerous forms of tubes, plates, dishes, etc., designed for laboratory purposes.

CENTRIFUGES. International Instrument Co., Cambridge, Mass. An extensive line of centrifuges and other apparatus, including Kjeldahl racks and bottle shakers for analytic work.

ALUNDUM CRUCIBLES. Norton Co., Worcester, Massachusetts, manufacturers of combustion boats, filtering covers and disks, electric laboratory furnaces, etc.

OPTICAL INSTRUMENTS FOR INSPECTION AND TESTING OF MATERIALS. Bausch & Lomb Optical Co., Rochester, New York. Microscopes and accessories.

MEASUREMENT OF CONDUCTIVITY OF ELECTROLYTES. Catalog 48. The Leeds & Northrup Co., Philadelphia, Pennsylvania.

BULLETIN 12. Hoskins Manufacturing Co., Detroit, Michigan. Electric furnaces, pyrometers and hot plates.

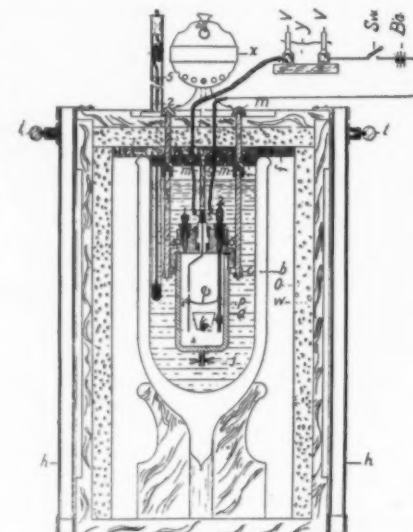
LABORATORY APPARATUS.

AN IMPROVED CALORIMETER.

CALORIMETERS for industrial laboratory use are not usually adiabatic, permitting an appreciable loss or gain of heat because of relatively imperfect insulations, which fail to prevent

the interchange of outside and inside temperatures. The Riche calorimeter is so free from complicated details that it is said a person with only ordinary mechanical knowledge of the principles can carry out perfect determinations with it in half the time required by other calorimeters.

This instrument is encased in a cork-lined cabinet of wood, and equipped with electrical



means for igniting the material being tested. The special feature which should be noted is that a glass vacuum cup is used to contain the water and bomb. By this arrangement the entire heat of combustion is confined for a period of at least one-half hour.

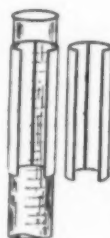
The bomb is a two-valve, porcelain-lined type, guaranteed for 3,000 determinations, but with proper care good for 8,000 or more combustions, the two-valve arrangement allowing for carbon dioxide determinations. Any style of bomb, however, may be used in this calorimeter. [Lenz & Naumann, Inc., New York City.]

DEVICE FOR READING BURETTES.

A simple and effective device for reading burettes is thus described by R. S. Poindexter:

Take a piece of white rubber tubing 5 cm. long, and of a diameter of about one-half that of the burette. Slit it down one side, open it out, and with a ruling pen and black ink make a 1 mm. line down the center.

When placed on the burette it will hold tightly, and may be pushed up and down when the reading is made. The refraction of the solution in the burette causes a distinct pointer at the bottom of the meniscus, making the reading very easy.



NEW JERSEY ZINC CO.'S ANNOUNCEMENT.

The New Jersey Zinc Co., New York City, announces the following prices on Florence brand, French process, oxide of zinc, for shipment on contract, during the second three months of 1916:

| | Carloads. | Less Carloads. |
|------------------|--------------|----------------|
| White Seal | 25 cents | 25 1/4 cents |
| Green Seal | 24 1/2 cents | 24 3/4 cents |
| Red Seal | 24 cents | 24 1/4 cents |

The above prices are based upon shipments in barrels f. o. b. shipping point, with freight allowance as heretofore on carload lots only. The above prices effective from March 2, and subject to change without notice.

Contractors are requested to advise promptly the quantity desired to be covered by contract.

Processes of Rubber Footwear Manufacture.

THE INDIA RUBBER WORLD for December, 1915, contained an article on "Modern Industrial Methods in the Rubber Industry," which attracted the attention of a well-known rubber superintendent, who at once wrote the Editor of THE INDIA RUBBER WORLD, commending the article, at the same time suggesting that the beginning of efficiency was in the arrangement of the factory. He submits the general plan or layout, shown in the adjoining column, outlining the general flow of materials. In this instance it applies to the manufacture of rubber footwear which affords a typical opportunity for co-ordinated systems of cost accounting and efficient operation. Certain of the departments named would require sub-division in actual operation to take care of special features of stock preparation and other work preliminary to actual shoe making. The plan is actually a basic one and with modifications could be utilized for a variety of lines of rubber manufacture.

MANUFACTURING PROCESSES.

The general process of rubber footwear manufacture are briefly described below in the order indicated in the departmental plan, omitting all details descriptive of machinery, tools or appliances necessary to the work:

WASHING.—Crude rubber is softened by soaking in warm water; cut and washed for removal of soluble and mechanical impurities. It is delivered in rough sheet form to the drying department.

DRYING.—Washed rubber is prepared for further treatment by air or vacuum drying.

MILLING.—The dry rubber is masticated on warm mills to average its quality.

WEIGHING.—Rubber, reclaimed rubber and mineral ingredients are weighed for mixing in standard lots or batches.

MIXING.—Standard batches are mixed, and refined as rubber stocks.

FABRICS.—Fabrics are machine dried and rolled on shells preliminary to calender coating.

WARMING.—The refined mixed rubber stocks are softened on warming mills preparatory to calendering.

CALENDERING.—Rubber stocks are sheeted for uppers, soles and heels.

Fabrics are coated with rubber to prepare them for use as linings, stay pieces or outside finish for shoes.

CUTTING.—Calendered materials are cut by hand or machine to specified patterns.

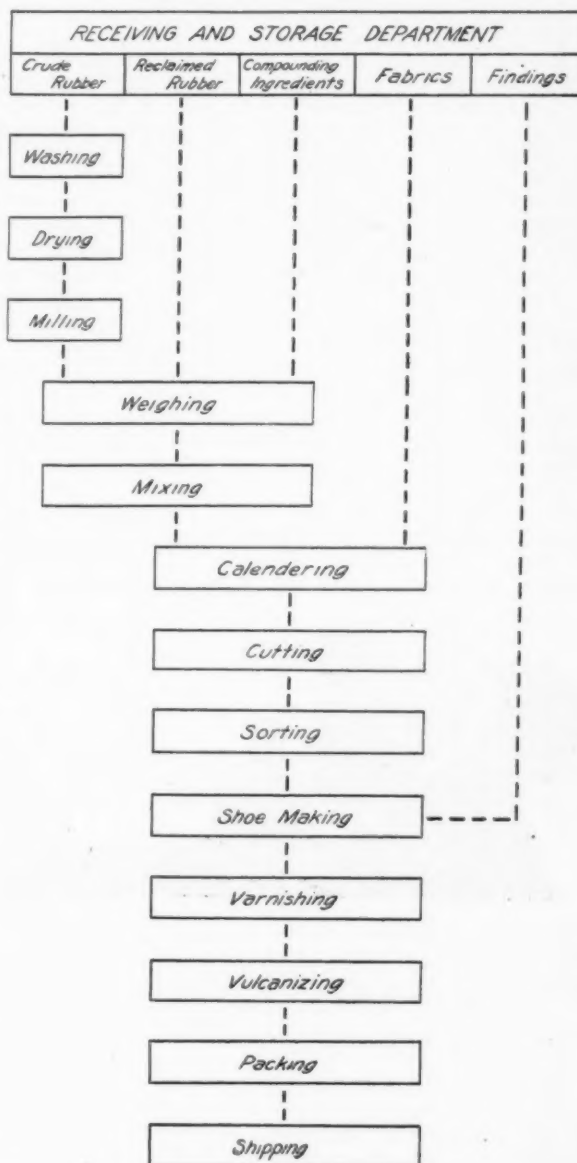
SORTING.—The various shoe parts of rubber and rubberized fabrics are counted and grouped in parcels by shoe makers' numbers, in accordance with printed tickets of instruction, proceeding from the order department.

CONSTRUCTION.—The rubber and rubberized parts are built in proper sequence on wooden or metal lasts, into boots and shoes.

VARNISHING.—The unvulcanized goods are varnished either by hand or by dipping machine. Dull surfaced goods proceed direct from making to vulcanizing department.

VULCANIZING.—Goods, racked in cars, are vulcanized in chambers heated by dry steam heat or by various pressure cure systems.

PACKING.—Goods are removed from the lasts, paired, marked, inspected and boxed. The lasts are returned to the making department if needed immediately; otherwise they are stored until required.



MANUFACTURING PLAN FOR RUBBER FOOTWEAR, SHOWING STORAGE AND FLOW OF MATERIALS.

Auxiliary to this plan there are required the following departments:

1. Power, light and heating.
2. Designing department for goods, patterns and lasts.
3. Press department for molding boot heels.
4. Cement making department.
5. Varnish making department.
6. Dye house for coloring linings.
7. Printing office for tickets, labels and factory forms.
8. Repair department, including machine, roll engraving, carpenter, pipe-fitting, blacksmithing and electrical shops.
9. Last making department.
10. Box making department for wood and paper boxes.
11. Rubber reclaiming department for waste.

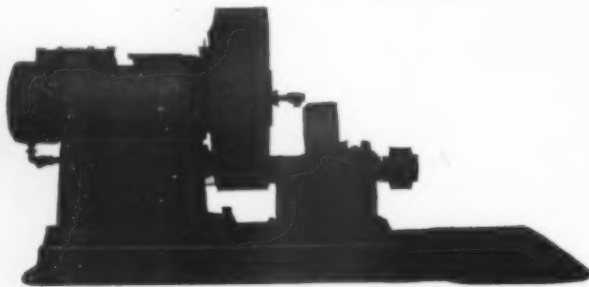
New Machines and Appliances.

ALLEN 10-INCH TUBING MACHINE.

THE steady growth and expansion of the rubber industry is reflected in the insistent demand for larger capacity machines used in the making of rubber goods. That the tire business is no exception to this rule is shown in the illustration of a large and powerful tubing machine, designed for making solid truck tires.

The machine is of extra heavy design. The feed box measures 9 by 10 inches, and is capable of handling large quantities of stock without forcing the feed. The length of the cylinder has been increased to allow greater bearing surface for the worm, thereby increasing the compression and giving greater density to the stock. The stock worm is made from a solid forging, bored for water circulation, the delivery end being counter-bored, thereby reducing the metal at this point so the circulating water will more readily cool the worm.

The stock worm spur gear has a 12-inch face and a bronze bushed hub bearing directly on the thrust block. This is 22 inches in diameter at this point, resulting in a large and rigid bearing that greatly relieves the worm from the usual side thrust strain. The reduction gears are double helical cut, with semi-steel gear and forged steel pinion. The outboard bearing pedestal is en bloc, the three bearings being cast in one piece with large oil reservoirs and self-oiling devices. All gears are entirely protected by heavy steel guards. The bed plate is



continuous and provides space for the motor, which is supplied by the purchaser. A 60 h.p. variable speed D. C. motor is considered good practice. [Allen Machine Co., Erie, Pennsylvania.]

A MACHINE FOR TRADE-MARKING FABRICS AND PROOFED RUBBER GOODS.

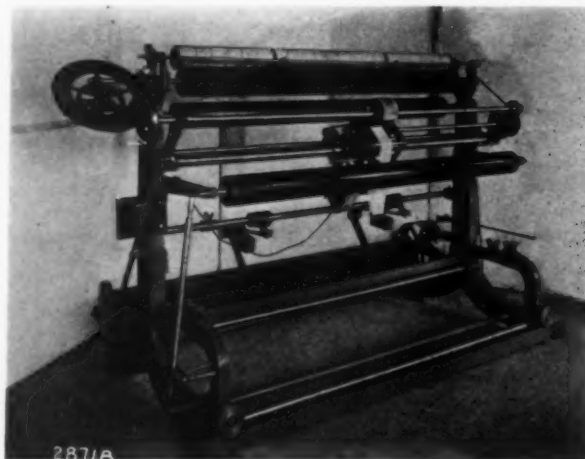
The manufacturers of tire fabrics, proofed fabrics and carriage cloth will be interested in the following illustrated description of a machine that has recently been adapted to the rubber industry.

The Kaumagraph machine takes the cloth from the roll or loose fold, trade-marks it, measures it and delivers the goods in the roll. Moreover, the fabric can be inspected at the same time.

The trade-marking attachment is mounted above at the right hand end of the machine and stamps on the upper surface of the cloth, so that the impressions may be inspected immediately after being struck and without stopping the cloth.

The machine is fitted with a hand wheel and screw to adjust the attachment for different widths of goods. The cloth will, therefore, always run in the center of the machine. The adjustment is so quick that various widths of pieces may follow each other without inconvenience. The trade-marks may be spaced at any distance apart and convenient means are provided to place a trade-mark close up to the ends of each piece.

The double drum rolling mechanism at the back of the machine has guide stands with quick adjustments to take any gudgeoned roller within the machine's capacity. The cloth may be threaded direct from the stamping table to the roll, or may first



pass under both drums, around and outside of the outer drum to the roller. The latter threading gives the stronger drive and a harder roll. Those who market their fabrics wound in the open width on any kind of a roll or tube, can adapt this as a final packaging machine.

The following are the specifications: Widest cloth capacity, 66½ inches; driving pulley diameter, 10 inches; revolutions per minute, 60; belt width, two inches; length over all (right and left), 98 inches; depth (front and back), 50 inches; height, 68 inches; shipping weight, 1,500 pounds. [Parks & Woolson Machine Co., Springfield, Vermont.]

MACHINE FOR SLITTING AND REWINDING RUBBER.

Cameron's slitting and rewinding machine can be used on all sorts of rubber goods such as sheet rubber, coated fabric, canvas belting, insulation, etc.

The slitting wheel, which presses rather than cuts through the material, is a disk having a V-shaped edge, blunt and mounted



on a ball-bearing center, pressed against a highly polished steel cylinder. Very little attention is required to keep it in good working order. The fabric passes between the cutter roll and

the slitter wheels, and is severed into strips of the desired widths, which go forward side by side to the rewinding mandrel. The cutter gives a clean, smooth slit, does not stretch the edge of the fabric, and can quickly be set for spacing. Strips of any width or any combination of widths may be cut at the same time. The apparatus for rewinding the goods following the slitting is of the drum type, and is so arranged that the resulting rolls are very firm and compact. Provision is also made for removing a wrapper or separate cloth from the material previous to slitting, and for reinserting a wrapper in the re-wound coils as they are rolled up after the slitting process. A variation is the making of slitting wheels with zigzag edge, by which strips can be cut which will not fray at the edges, and are especially suitable for surgeon's bandages, with the result that at one process, goods can be converted from piece form into finished bandages. [Cameron Machine Co., Brooklyn, New York.]

HAND OPERATED CLOTH OR RUBBER TESTER.

This is an inexpensive fabric tester that is now being used to advantage in the rubber trade, particularly in the manufacture of footwear. The resulting tests obtained by this very simple machine are extremely accurate.

As illustrated, it is 5 feet long, and is mounted on a strong oak back-board, fitted with three malleable brackets for fastening to the wall. Built on the dead weight or swinging pendulum principle, it has no springs to affect the test and therefore remains accurate, but can be easily calibrated without the use of special apparatus. The clamps are designed to make various styles of tests and the open space back of the flat gripping surfaces allows any number of tests to be made on large samples without cutting or stripping. Special clamps can be applied for making rubber tests which would make this machine very useful in checking results.



The test is made by turning the large hand wheel which moves the stretching screw through powerful, machine-cut, spiral gears. The pendulum or weight lever is suspended from two finely-made, self-aligning,

hardened steel ball-bearings which insure against friction and unnatural resistance. The dial registers in pounds and the test is shown by the pointer which remains at the position of the break until rest by the handle suspended from the curved quadrants.

Very little effort is required to make tests and experience has shown this to be a very quick machine for practical work. All parts of this machine are built to United States standards and are interchangeable. [Henry L. Scott & Co., Providence, Rhode Island.]

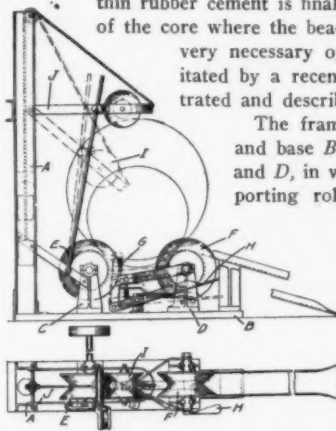
APRON FEED FOR MIXING MILLS. This latest invention of Welton's automatically holds both edges of the apron sufficiently tight to effect positive forward movement when lumpy or sticky compounds are mixed. [P. E. Welton, Cuyahoga Falls, Ohio. United States patent No. 1,173,625.]

Two patents granted to the same inventor, for similar devices, were described in THE INDIA RUBBER WORLD, June 1, 1915.

MACHINERY PATENTS.

GAMMETER'S PNEUMATIC TIRE CORE REVOLVING MACHINE.

THE heavy cast-iron cores used in making tire casings require scraping and brushing after each molding operation to remove accumulations of adhering rubber. Moreover, a coating of thin rubber cement is finally applied to the side faces of the core where the beads are to be placed. These very necessary operations are greatly facilitated by a recent invention, herewith illustrated and described.

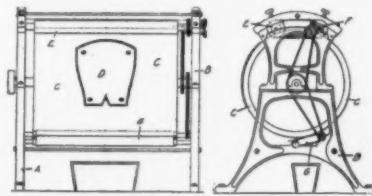


The frame comprises an upright *A* and base *B*, provided with bearings *C* and *D*, in which revolve two core-supporting rollers *E* and *F* having V-shaped peripheries—the former being belt driven, and the latter an idler. Between these rollers is mounted a Y-shaped core rest *G*, that is raised and lowered by the treadle *H*. The upper guide roller *I*, with a V-shaped periphery supports the core in an upright position, and is journaled on the swinging arm *J*, which can be raised and lowered to accommodate cores of various diameters.

The machine is operated by first raising the core rest, which is done by the foot on the treadle; then the core is rolled up the incline by the operator and placed on the idler roller and core rest. The latter is then lowered until the core rests on the driving roller, when the upper guide roller is lowered into operative position to maintain the core upright. The operator then starts the machine and performs the various cleaning operations with the use of scraping and brushing tools, while the core is being rapidly revolved. A coating of thin rubber cement is finally applied to the side faces of the core, which completes the operation. [John R. Gammeter, Akron, Ohio, assignor, to The B. F. Goodrich Co. of New York, New York City. United States patent No. 1,172,883.]

BOOT TOP LAYING AND CUTTING MACHINE.

Cutting and laying boot top linings, and in fact all other similar operations in footwear manufacture, are invariably performed by hand. This hand labor is laborious, tedious and costly, and besides, the product is often defective, due to the well-known fallibility of the human factor in manual operations.



The machine shown in the accompanying illustration has been recently invented to do the work of applying the fabric lining, used to reinforce footwear parts, to the sheeted rubber stock.

Side frames *A* and *B* support the revolving drum *C*, on which are removably fastened forms or dies similar to the one shown at *D*.

A sheet of stock is fed between the drum and the pressure roller *E*, one of the fabric linings being previously placed in the form *D*. The drum is then revolved and passes under the roller *E*, which firmly presses together the lining and superimposed rubber sheet, passing under heated roller *F*. As the drum continues to revolve, the boot top with attached lining is cut out

of the rubber sheet by heat and pressure of the roller against the edges of the form. After the form has passed beyond the roller *F* the reinforced boot top is removed by the operator. The scrap pieces are stripped from the drum by the action of belt *G*, which delivers them to the hopper under the machine. [E. B. Herman, East Watertown, Massachusetts, United States patent No. 1,173,426.]

SOLID TIRE DRILLING MACHINE. Solid and cushion tires may be drilled on this machine, to accommodate cross wires that engage the side wires holding the tire to the rim. [William C. Stevens, assignor to Firestone Tire & Rubber Co.—both of Akron, Ohio. United States patent No. 1,171,552.]

TIRE BEAD CENTERING DEVICE. This consists of a ring provided with an annular recess conforming to the contour of the finished bead. The ring is centered by three shouldered brackets or arms which slide within the inner circumference of the core. When the ring is revolved the bead is laid on the casing and accurately centered with relation to the tire. The other bead is applied in the same way. [John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City, United States patent No. 1,164,804.]

METHOD OF MAKING A CORD CARCASS FOR PNEUMATIC TIRES. Two layers of rubberized cord are laid spirally on the core, at a reverse angle, forming the carcass. This is slit around the inner circumference and the bead cores interposed between the open plies. The core is then removed from the winding machine and a section ring attached to the inner periphery of the core, supporting the beads. The casing and tread are then built up, the two side rings for molding the beads applied and the whole wrapped and vulcanized by the open cure process. [Walter R. Denman, assignor to Miller Rubber Co.—both of Akron, Ohio. United States patent No. 1,172,115.]

MANDREL FOR MAKING INNER TUBES. This invention comprises a mandrel provided with a depression for receiving materials for the valve patch which is made homogeneous with the tube. [Charles E. Foutts, East Liverpool, Ohio, United States patent No. 1,173,944.]

FOOTWEAR REPAIRING OUTFIT.—A new arrangement for repairing rubber footwear consists of a portable vise upon the anvil of which the shoe is placed, with the portion to be repaired uppermost. If the sole is to be renewed, a piece of rubber is placed over the old sole, and upon this is clamped a sheet of lead with any desired surface configuration, and having a projecting flange. This is hammered down against the edges of the sole or heel piece, thus giving a rolled edge similar to that of a new shoe. Then the shoe is removed from the vise, and after the parts are clamped in any suitable holder it is vulcanized. The result is a finished sole or heel substantially equal to that of a new shoe in neatness and finish. [James W. Arthur, Warren, Ohio. United States Patent No. 1,174,799.]

HYDRAULIC TIRE VULCANIZING MOLD AND PRESS.—The object of this apparatus is to partially vulcanize the tire cover before the curing operation which gives the tire its final shape. This relates more particularly to those having beaded edges, which are not rigid in the uncured condition. [Colin Macbeth of Birmingham, England, assignor to The Dunlop Rubber Co., Limited, Westminster, England. United States patent No. 1,174,885.]

A complete description of this machine was given in *THE INDIA RUBBER WORLD*, December 1, 1915, page 122, British patent No. 11,732 (1914).

OTHER MACHINERY PATENTS.

THE UNITED STATES.

ISSUED FEBRUARY 29, 1916.

- 1,173,424. Rubber working machine. E. B. Herman, East Watertown, Mass.
1,173,449. Mold for making innersoles. C. B. Mansbach, assignor of one-half to F. L. Price—both of Brockton, Mass.

- 1,173,626. Feed mechanism for mixing mills. P. E. Welton, assignor to K. B. Welton—both of Cuyahoga Falls, Ohio.

ISSUED MARCH 7, 1916.

- 1,174,095. Machine for compacting parts of reinforced innersoles. E. S. Simpson, North Scituate, and P. M. Vayette, Quincy, assignors to Clifton Manufacturing Co., Jamaica Plain—all in Massachusetts.
1,174,738. Slitter and rewinder. S. M. Langston, assignor to Samuel M. Langston Co.—both of Camden, N. J.

THE DOMINION OF CANADA.

ISSUED DECEMBER 31, 1915.

- 166,409. Tire mold core. The Gutta Percha & Rubber Limited, assignee of J. H. Coffey and J. H. Coffey, Jr.—all of Toronto, Ontario, Canada.

THE UNITED KINGDOM.

ISSUED FEBRUARY 16, 1916.

- 21,478 (1914). Machine for cutting jar rings and washers. Bertrams, Limited, St. Katherine's Works, Sciennes, and R. F. Gillespie, 58 Arden street—both in Edinburgh.
A similar machine was illustrated and described in *THE INDIA RUBBER WORLD*, May, 1915. British patent No. 1,916. Jar ring lathe. Bertrams, Limited, and R. F. Gillespie.

ISSUED MARCH 1, 1916.

- 22,105 (1914). Cooling roll for mixers. J. H. Nuttall and D. Bridge & Co.—both of Castleton, Lancashire.

ISSUED MARCH 8, 1916.

- 22,489 (1914). Machine for coagulating latex. S. C. Davidson, Sirocco Engineering Works, Belfast.

THE GERMAN EMPIRE.

PATENTS ISSUED (With Dates of Validity).

- 290,322 (March 5, 1915). Strip cutting machine for rubber sheets and similar materials. Dr. Karl Lehmann, Karlsstrasse 4, Berlin-Lichterfeld.
290,295 (October 21, 1913). Kneading installation for working plastic masses. Albert Sigwart, Karlsstrasse 7, Ludwigshafen-on-the-Rhine.
290,856 (December 28, 1915). Apparatus for coagulating crude rubber. Th. L. Adolf Runge, 61, Podbielskistrasse, Hanover.

NEW MANUFACTURING PROCESSES.

THE UNITED STATES.

MANUFACTURE OF HEELS. Scrapped solid tires are cut transversely and made into heel blanks which are built up and formed into finished heels provided with washers and nail holes by heat and pressure. [U. S. Patent No. 1,172,919. Henry C. Weber, Port Jefferson, New York.]

MOLDING AND VULCANIZING TIRES. Pneumatic tires are molded on a core in a sectional mold. The tread portion is removed radially, while the sides and edges of the tire are stretched in a direction away from the tread. The tire is subsequently removed from the mold and vulcanized in any suitable manner. [United States patent No. 1,166,326. J. H. Coffey and J. H. Coffey, Jr., Ontario, Canada, assignors of one-half to Gutta Percha Rubber, Limited, Toronto, Canada.]

UNITING HARD RUBBER AND METAL. Hard rubber and a threaded metal member are united by heating the former and screwing the latter into an opening in the heated hard rubber, which is then allowed to cool. [United States patent No. 1,165,680. George C. Knauff, Chicago, Illinois.]

UTILIZING WASTE RUBBER. Soles and heels of footwear are made by disintegrating unvulcanized scrap, and subjecting this material to pressure and vulcanization. [British patent No. 21,445. G. W. Beldam, Ealing, and A. U. B. Ryall, Brentford, both in Middlesex.]

OTHER MANUFACTURING PROCESS PATENTS.

THE UNITED KINGDOM.

ISSUED FEBRUARY 23, 1916.

- 21,768 (1914). Hot water bottle. T. Rowe, 52 Harold Road, Leytonstone, London.

THE GERMAN EMPIRE.

PATENT ISSUED (With Date of Application).

- 290,713 (April 11, 1913). Process for making hollow objects out of rubber. Dr. Carl Daeschner, 21 Gilbachstrasse, Cologne.

THE EDITOR'S BOOK TABLE.

HANDLEIDING VOOR DE BEREIDING VAN RUBBER. BY DR. P. ARENS. Published in the Dutch language as a communication of the Malang Test Station, Malang, Dutch East Indies. 18vo, 45 pages. Paper bound.]

AS indicated by its title, "Manual for the Preparation of Rubber," this work is intended to serve as a handbook for the use of planters in preparing their rubber for market. It is especially intended for planters in the Dutch colonies but can be used to advantage by all rubber planters acquainted with the language of the Netherlands. A clear idea of its scope can be formed from the following titles of its several chapters:

Latex in the Gardens and in the Factory; Determination of the Rubber Content of Latex; Preparation of Rubber Sheet; Mistakes Made in Preparing Rubber Sheet; Preparation of Rubber Crêpe; Mistakes Made in Preparing Rubber Crêpe; Preparation of Inferior Sorts (of rubber); Mistakes Made in Preparing Inferior Sorts; The Sorting and Packing of Rubber; Prescriptions for Making Solutions Used in the Preparation of Rubber.

NEW TRADE PUBLICATIONS.

THE Miner Rubber Co., Limited, Granby, Quebec, Canada, has issued its catalog No. 7 for 1916-17. It is a handsomely illustrated 64-page book showing the many styles of rubber footwear made by this company. A decided innovation in printing pictures of rubber footwear is the showing of the rubber overshoe in full black, while the exposed portion of the shoe is printed in a soft gray half-tone effect, making a striking illustration. Beside the regular line of rubber boots and shoes several specialties are shown, one being a rubber boot of heavy gum with leather sole quilted with hob-nails. There are also boots with red soles and boots entirely of red gum. A list of the new pressure-cured goods in gray finish is illustrated, and also a large list of outing shoes in white, gray, tan and blue canvas with self-colored or contrasting rubber soles. The book contains other information of interest to dealers in this brand of rubber footwear.

Link-belt machinery is fully described and pictured in a finely printed book published by the Link-Belt Co., Chicago, Illinois, in which are shown many fine half-tones of the lines of conveyors and elevators made by this company. Of special interest to the trade are the conveyor belts offered by this concern, which are rubber belts from three to ten ply, with an extra rubber cushion on the carrying side 1/16th to 1/4 of an inch in thickness. This cover or cushion is turned around the edges and vulcanized on the under side, and thus is less liable to crack or peel off than might be the case with belts where the rubber edges are molded on separately. There is much information of a general character for concerns handling coal, stone, gravel, sand or similar products.

W. G. Brown & Co., Cincinnati, Ohio, dealers in crude rubber, distribute monthly a picturesque little calendar, the one for March bearing a striking lithograph of two midnight visitors with burglarious intent arousing a sleeping couple. While, perhaps, the picture is not particularly appropriate to the business of the firm, the calendar is an attractive and convenient desk ornament.

Decreasing truck vibration is treated in a booklet issued by The B. F. Goodrich Co., Akron, Ohio, explaining the "De Luxe" and regular solid truck tires made by that company. Illustrations and diagrams, together with suitable

text, are intended to prove that these tires decrease truck vibration and tend to give more comfortable as well as much longer and more durable service than ordinary tires. The booklet, though a small one, is gotten out in very attractive form and reflects great credit on the advertising department of the Goodrich company.

The Kokomo Rubber Co., Kokomo, Indiana, is sending out to the trade a rather striking folder which shows a half-tone reproduction of the first automobile built in America and which was equipped with the first automobile tires made in America or in any other country. The folder is devoted to advertising the Kokomo Gridiron Non-Skid and the Kokomo Smooth Tread tires, both of which are pictured and explained. In a corner of the folder is a form which can be detached, then becoming a post-card directed to the company, which needs only the signature and address of the sender to receive further information regarding these tires.

A very attractive piece of advertising comes from the Canadian Consolidated Rubber Co., Limited, Montreal, Canada, it being a folder bearing the question: "Who Wears Rubber Footwear?" and answering that question by showing about 30 pictures of people in various walks and rides of life wearing rubbers. The vacuum process of vulcanizing is explained with a cut showing a hand holding a piece of the pressure cure soling and another piece vulcanized by the old method, thus contrasting strongly the difference between the two. The folder is as attractive in its text as it is in its illustrations, and is one which will be given more attention than the average piece of circular mail matter.

Another folder gotten out by this company that is worthy of special mention is one showing a rolled edge lumberman's over, and one with a plain edge sole, but of red rubber. A fine looking young man is represented as showing the differences between these two, being photographed in various positions, the accompanying argument being that as each has the same amount of rubber in the sole, the plain edge sole necessarily has more wear where the wear comes than if a portion of the material was surrounding the upper. Some argument regarding the vacuum vulcanization is also given. The circular is attractively displayed in three colors of ink, and is a worthy companion of the previously mentioned one.

The Raw Products Co., New York City, is sending out to its customers a very comprehensive sheet giving the India rubber statistics for the year ending December 31, 1915, which shows the United States imports and stocks on hand of the various kinds each month in the year, the same facts regarding England, and the monthly quotations, the arrivals at Para, stocks at Para and Manaus and the plantation production. There is also a diagram showing the fluctuations of fine and coarse Para and of First latex crêpe for 1913, 1914 and 1915. It will make a very convenient and comprehensive document for ready reference.

Owing to the seizure by the British Government of many of the motor vehicles for war purposes, there has been a remarkable increase in the importation of American trucks and other commercial vehicles. As the tires for these are measured in inches, while tires made upon the continent or in Great Britain are almost invariably given in metrical measurements, The B. F. Goodrich Co., Limited, London, England, has issued a booklet entitled "Goodrich Solid Rubber Band Tyres. Inch Sizes for American Vehicles." Besides a general description, with half-tone illustrations and diagrams, it gives in tabulated form the size in inches, the diameter over permanent steel band, maximum load for tire, price, and code word for facili-

tating ordering. There is also included considerable information regarding the care and abuse of solid tires and some hints regarding alignment, with simple means for testing, this being illustrated by diagrams. The book also contains the guarantee which the company furnishes with each sale of its solid tires.

"Rubber Facts and Figures" is the title of a compact little book of about 140 pages published at somewhat irregular intervals by Frederic C. Mathieson & Sons, London, England. Number 13, bearing date of February, 1916, is at hand. While small enough to go in the pocket, a vast amount of information has been crowded into it regarding rubber planting corporations in the Far East, telling the authorized capital, highest and lowest prices and number of shares, number of acres planted in rubber, dividends paid, etc. The increases in the outputs month by month during the past two years are given in tabulated form. The number of forward sales announced for 1915 and 1916 is also given. In fact, the book is one which will be found of use as a ready reference by all interested in plantation rubber, either as consumers or investors.

DETERMINATION OF BARIUM SALTS IN VULCANIZED RUBBER GOODS.

SPECIFICATIONS for purchasing rubber goods frequently permit the use of barytes (barium sulphate) as a mineral filler without having the sulphur which it contains count as part of the specified total sulphur. In such cases, in order to properly correct the total sulphur, the barium sulphate must be determined. The Bureau of Standards, of the Department of Commerce, has recently completed a careful study of the question and has just published the results in "Technologic Paper No. 64."

When barium sulphate only is used, the amount present is readily ascertained by determining the total amount of barium present. If barium carbonate is used, it is necessary to separate the two salts. By means of tests made on compounds of known composition prepared at the Bureau of Standards, a method has been devised which permits the quantitative determination of barium carbonate in the presence of either lead sulphate or barium sulphate, the two sulphates most commonly used in rubber goods. The accuracy of the determination is satisfactory for all practical purposes. This method of analysis for barium carbonate, which is the work of John B. Tuttle, is as follows:

One gram of the rubber is ignited in a porcelain boat in carbon dioxide, the residue finely ground in an agate mortar, transferred to a 250 cc. beaker, and treated with 5 to 10 grams ammonium carbonate, 15 to 20 cc. of strong ammonia water, and about 50 cc. of distilled water. The mixture is boiled for 15 to 30 minutes, filtered and the precipitate thoroughly washed to remove all soluble sulphates. The residue on the filter paper is washed back into the original beaker with distilled water. About 10 cc. of glacial acetic acid and sufficient water is added to make the total volume of the solution about 100 cc. By this procedure lead, barium, calcium and zinc carbonates pass into solution, while barium sulphate and lead sulphide are not attacked.

Hydrogen sulphide is passed into the filtrate, the lead sulphide filtered off, the filtrate heated on the steam bath, and 10 cc. of 10 per cent sulphuric acid added. The following day the precipitate is filtered, ignited, cooled and weighed.

The final step is to determine the total barium in the rubber compound, as barium sulphate, by the method for determination of barytes used at the Bureau of Standards [THE INDIA RUBBER WORLD, December, 1914, page 128.] Barium carbonate is determined in a separate sample by Mr. Tuttle's method, just described, and an equivalent amount of barium sulphate is deducted from the total barium sulphate. The sulphur in the remaining portion of barium sulphate is calculated, and the total sulphur determination corrected by this amount.

RUBBER TRADE INQUIRIES.

[155.] A correspondent seeks an American manufacturer who can furnish 5,000 valves for bicycle inner tubes, to be shipped from America to Singapore.

[156.] An inquirer desires to be placed in touch with a manufacturer of waxed paper, such as is used in wrapping inner tubes.

[157.] We are in receipt of an inquiry for Pontianak refining concerns.

[158.] An inquiry has been received for the name of a manufacturer of flexible rubber curry combs.

[159.] A correspondent wishes to be placed in touch with American firms who can supply crude rubber stock (washed, compounded and rolled into sheets but not cured) for use in the manufacture of about 15,000 inner tubes for automobiles.

[160.] The name of a company making and selling the hard rubber clincher bead which is the center of the bead used in making tires is desired.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Representation for American manufacturers of rubber goods is desired by a man in Argentina. Report No. 20,291.

A Portuguese firm, which exports rubber, desires to secure an import agent in New York City. This firm also wishes to represent American exporters of goods for Portuguese African colonies. Report No. 20,295.

Quotations from American manufacturers of jinrikisha tires are solicited by a firm in China using about 6,000 tires annually. Report No. 20,329.

A Norwegian firm would like samples and quotations f. o. b. New York on rubbers and arctics. Report No. 20,352.

A man in Italy wishes to purchase American jam jars and bottles for preserves or fruits, with tin lids and rubber rings. Report No. 20,369.

A Canadian firm would like to be placed in touch with American manufacturers and exporters of rubber window cleaners. Report No. 20,412.

Vulcanized fiber and other insulating materials are desired by a firm in England. Report No. 20,435.

A traveling agent in Norway desires to receive samples, catalogs, quotations, etc., from American manufacturers of rain-coats for both men and women. Report No. 20,448.

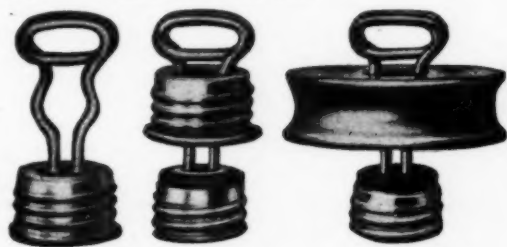
DRAWBACK FOR RUBBERIZED AUTO-TOP CLOTH.

The exportation of auto-top cloth has reached such proportions, due to war requirements, that the Treasury Department has prepared drawback regulations to meet the situation. As in the case of other classes of drawbacks, manufacturers are required to keep a detailed record of all data necessary for government agents to base a decision as to whether a drawback accrues or not. It is specified that the allowance shall not exceed the quantity of imported cloth used in the manufacture of the exported auto-top cloth, as shown by the abstract from the manufacturing record, the allowance to be reduced according to the quantity of imported cloth which the value of the waste, if any, will replace. The American Rubber Co. and the Stoughton Rubber Co. have been authorized to receive drawback under these regulations.

New Goods and Specialties.

THE DEAN NON-LOSABLE STOPPER.

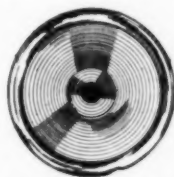
THE stopper of a hot water bottle is always getting lost or misplaced just when the family comforter is most needed. A stopper that is always on the job; that cannot be lost; that does not depend on a chain or exterior attachment, would be a boon indeed, and such apparently is the device described and illustrated as follows:



The inventor has reversed the principle of the old arrangement by placing the stopper inside the bottle instead of outside. A wire handle serves to operate the stopper. To open the bottle simply unscrew and push the stopper down far enough to allow free passage of the water either in filling or emptying. To close the bottle, just pull up on the handle and screw the stopper in place, the rubber washer making a water-tight joint when forced against the upper part of the outer metal socket. This device can be attached to a hand-made bottle as well as a molded bottle with a wide neck. [H. D. Dean, Boston, Massachusetts.]

SOFT-LITE HEADLIGHT DIMMER.

The laws of many states compel the use of automobile headlight dimmers to reduce the glare that is confusing and dangerous. The device we are now describing is made of a single disk of frosted pyralin that diffuses and effectively eliminates the glare of the headlight, yet illuminates the roadway fully 100 feet in advance of the car.

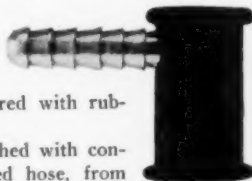


The quick, easy and secure method of attaching this dimmer is a feature that will be appreciated by the motorist. It is held securely in place on the inside of the headlight glass by a single vacuum cup of soft rubber. [The Harry H. Reynolds Co., 1326 Michigan avenue, Chicago, Illinois.]

RUBBER COVERED TIRE INFLATOR VALVE.

Garage men who have been annoyed by the carelessness of patrons, who, after inflating tires at their free air station, have neglected to shut off the flow of air, will welcome the new Schrader automatic inflating valve, which has just been put on the market, and which prevents any waste, either before, during or after inflation. The valve is covered with rubber for protection.

This device, which can be furnished with connections suitable for different sized hose, from $\frac{1}{4}$ to $\frac{3}{4}$ -inch diameter, fits into the tubing of the garage air line, and permits the egress of air only when it is applied to the valve of the tire to be inflated. All that is necessary is to hold the inflating valve's nozzle against the tire valve. This opens the valve check in the angle valve, and allows the air



to come from the rubber tubing into the tire. Immediately the pressure on the tire valve is removed, the valve in the hose automatically closes, and the air pressure remains in the tank. [A. Schrader's Son, Inc., New York City.]

LIGHT SPORTING BOOTS.

Many sportsmen would wear rubber wading boots were it not that they are so heavy and clumsy as to be uncomfortable when not actually required for going through the water. An improved, light-weight, storm king style sporting boot named "The Angler" is now manufactured, which can be worn over the leather shoe, and which, when not in use, is so light and flexible that it can be rolled up into a small enough package to be carried in the coat pocket. The advantage of such a boot is obvious without further comment. This particular boot is made of pure gum, is fusion lined and has an elastic top, thus fitting tightly around the leg.

[Canadian Consolidated Rubber Co., Limited, Montreal, Canada.]



A HANDY RUBBER STAMP.

The pencil cap here reproduced, actual size, is designed for use as a convenient rubber stamp for marking initials on cloth, paper, or articles of any kind. The desired initials are cemented on the plain, broadened base of the rubber cap, which fits easily and securely over the end of the pencil. In clerical work the advantage in the lessening of time and energy consuming motions can readily be seen, as the user does not have to put down his pencil to pick up a rubber stamp, but simply turns the pencil about and applies the stamping end. [The William Stern Manufacturing Co., Chicago, Illinois.]



Actual Size

PNEUMATIC REVERSIBLE LANDING MAT.

When a fire call is received at an engine house, stairs are too slow a method for the firemen in the upper story to gain the main floor. The vertical sliding pole gives the desired speed. The necessity of a landing mat that will minimize the shock of contact with the floor can readily be seen, and rubber mats are invariably used for this purpose. But in order to afford the proper yield and recovery the mat here shown has been specially constructed. It is claimed that a perfect pneumatic mat is thus secured, offering a soft, safe and durable landing at the base of the sliding pole. Each of the tubes supporting the wearing surface of the mat has a vent into the main air chamber, which is also provided with one or more vents



in the side wall. This permits a uniform escape of air which gives an even yield and recovery. Both sides of this mat are alike, so that it may be reversed and thus give double service. [Bowers Rubber Works, San Francisco, California.]

STAIR TREAD WITH RUBBER STUDS.

In the stair tread here illustrated, interchangeable studs, molded of tough, dark grey rubber, in a new design, fit into the grey-white, non-corrosive, cast metal plate which forms the body of the tread.

The studs are easily fitted by simply screwing down and are arranged in lateral rows, facilitating the operation of cleaning or sweeping. When the center studs are worn down, and this it is claimed does not occur until after considerable usage, it is a simple matter to rearrange them by the use of a screw-driver. When the treads are fastened on the stair an empty space is left behind the rear edge which may be filled with rubber matting, if desired. [The Reliance Rubber & Harwood Co., London, England.]



THE "TESTOID" RADIATOR HOSE.

In the radiator hose here illustrated the manufacturer claims to have secured a motor hose that will not harden, soften, crack or collapse, or be in any way affected by the heat generated from the motor. It is also guaranteed to withstand the action of oil, hot or cold water, and anti-freezing solutions. The cover is black, and the tube, cover and friction are all thoroughly tested compounds. The hose is furnished in either two-ply or three-ply duck, with plain or capped ends, or capped ends beveled; also with enlarged or tapered end, if desired. A similar variety of hose, called the "Thermoid," has a white cover.



The hose is packed according to a new system which is said to find favor with dealers. Six pieces, three feet long, each piece of a different diameter, or all of the same diameter, are packed in a box. The six largest selling sizes of hose are 1/4, 1/2, 3/4, 1, 1 1/2, and 2 inches, respectively, these sizes making a convenient assortment for a box. [Thermoid Rubber Co., Trenton, New Jersey.]

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THE "ROYAL" SPARK-PLUG TESTER.

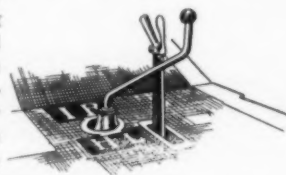
The "Royal" tester for spark plugs on automobiles, motorboats, motorcycles, etc., consists of a crotch containing the spark gap and two legs containing the terminals. One leg is three inches longer than the other, facilitating contact. The tester will show the regular spark when the plug is good, and if it is short-circuited there will be no spark. An irregular spark will indicate defective porcelain; a clear spark, lack of power in the motor. This convenient accessory is covered with hard rubber. [Pittsburgh Electric Specialties Co., Pittsburgh, Pennsylvania.]



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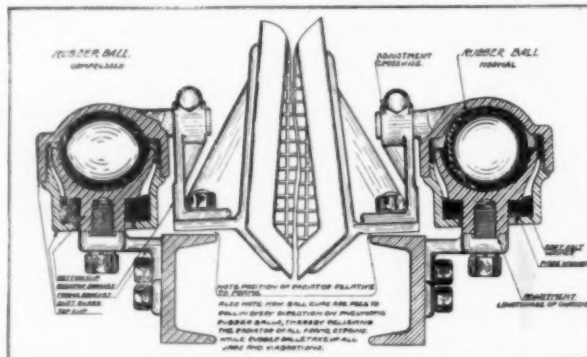
GEAR GUIDE-MAT.

Owing to the number of different gear positions on different cars, the unaccustomed driver frequently has difficulty in finding the right gear. In a 1916 model car all doubt and hesitancy is eliminated by the simple expedient of marking the gear positions in large, clear letters on the rubber mat in the driver's compartment, as shown in the accompanying illustration. [Grant Motor Co., Findlay, Ohio.]



A FLEXIBLE RADIATOR SUPPORT.

A novel feature of the Menominee truck is the radiator support, which forms a flexible joint between the chassis and radiator. A hollow rubber ball encased in each connection,



guards the radiator against road shocks, vibration and all warping stresses. The device is protected against dirt and grit, and the brackets carrying the head lamps are also supported on this pneumatic shock absorber. [D. F. Poynter Co., Menominee, Michigan.]

THE TURNER AVIAPHONE.

Noiseless flying machines have still to be invented. The propeller and motor of flying craft, in its present state, create so much noise that a pilot and passenger cannot hear each other speak. This difficulty

has finally been overcome by the invention and perfection of an instrument called the "Turner Aviaphone." A rubber face mask with an aluminum mouthpiece, connecting with the breastplate transmitter by means of a hard rubber tube, is used only during conversation. There are two helmets, or caps, two specially wound receivers for each user, connecting cords, battery, plugs and jacks; the entire outfit weighing only 5 pounds

5 ounces. Caps, as shown in the illustration, are furnished but the receivers can be adjusted to any type or size of headgear. This instrument is of especial value to army and navy aviation corps, as it leaves the hands entirely free. [General Acoustic Co., New York City.]



BATHING COSTUME NOVELTIES.

RUBBER accessories for the bathing costume have grown more numerous every year, and also more attractive. The innovations of this season far surpass those of former years in utilization of this product for combined ornamental and practical purposes.

The first illustration shows a charming costume for the trip to and from hotel or bathing house, conforming to the regulations of some seaside resorts requiring that the bathing suit be covered. The smock worn over the bathing suit is made entirely of rubber, in a pleasing



shade of light blue with a white collar. The smocking on the front, back and sleeves is accomplished by clever cementation of the rubber instead of sewing.



With this highly becoming yet utilitarian garment is worn a "Chin-Chin" hat in black and white, the under part forming a skull cap, which affords adequate protection for the hair.

In the Spanish costume shown in the second sketch a novel style in bathing suits is inaugurated. It is intended to be worn over an Annette Kellerman suit, and comprises a one-piece rubber tunic in a clear, light red, with black



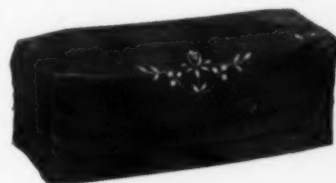
rubber fringe trimming. The coquettish swathed turban is also in red with black fringe.

The sash worn in the form of a knotted girdle with tasseled ends, and the Tam O' Shanter cap in the third illustration are made of black and white striped rubber and are striking adjuncts to the bathing costume. Within the Tam O' Shanter and cemented at the edges is a skull cap of gold-colored rubber, which fits snugly over the hair.

Still another novelty is a hat-brim of rubber, the inner edge encircled with rubber flowers, that can be placed over the skull cap as a protection from sunburn when not in the water. [L. C. Studios, New York City.]

BATHING SUIT CASE.

Department stores are showing this very presentable case for carrying a wet bathing suit. It is made of black sateen, fitted with a separate rubber lining. It has snap fastenings, and is tastefully decorated with an embroidered flower motif in varying shades of pink, with green stems.



S. S. WHITE BUFF RUBBER DAM.

The rich cream or buff color of this improved rubber dam for dental use helps to light the oral orifice. It is claimed that the texture is exceptionally elastic, strong and durable and that when placed around the tooth which is to be operated upon, it clings closely, excluding all moisture and keeping the cavity in the absolutely dry condition necessary for successful filling. The dam is highly useful in abdominal operations where the surgeon makes his incision through the rubber into the tissue. There is no risk of injurious contamination through direct contact of the dam with the body secretions. It is recommended for the following uses in surgery: As surgical sheeting, in oral dental surgery, in abdominal surgery, for abdominal dressings, for surgical bandages and pressure bandages, for moist dressings or Priestness dressings; or it may be cut in small strips and used for ligaturing, as it is strong enough to allow any pressure that may be desired. This dam is made in rolls of two widths, five and six inches, and two thicknesses—thin and medium. [The S. S. White Dental Manufacturing Co., Philadelphia, Pennsylvania.]

THE "KLEENWAY" AUTO BRUSH.

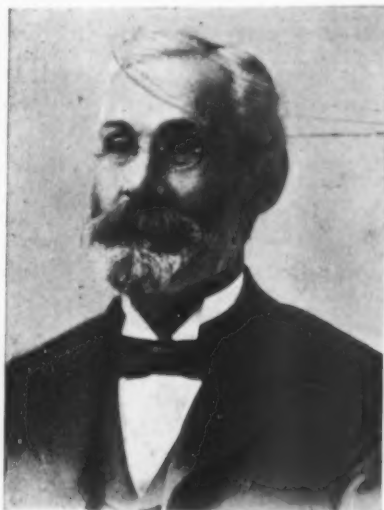
Washing an automobile with an ordinary sponge and water bucket is a tiresome and unpleasant operation. In the "Kleenway" auto brush, here illustrated, a convenient and also more efficient method is afforded. Attached to five feet of rubber hose, with coupling for attaching to house hose, is a specially constructed brush containing a soap chamber of nicked brass tubing. A brass two-way valve in the handle is operated by thumb pressure, giving suds or clear water, as desired, and the flow of clean suds or water through the brush automatically frees the bristles of grit, grease, etc. The bristles are rubberset, and therefore cannot fall out, and being of Tampico fiber, will not scratch. The handle is of white wood. Any good automobile soap can be used with this brush; it is easy to operate, and, it is claimed, cleans the car in half the usual time, with much less than the customary consumption of soap. [The S. & E. Co., New York City.]



The Obituary Record.

A PIONEER RUBBER MANUFACTURER.

THEODORE H. VIDETO, who for more than 30 years was connected with various New England rubber manufacturing enterprises, died at his home in South Framingham, Massachusetts, at the age of 82 years. He was born in Wilmot, New Brunswick, February 23, 1834. At the age of 17, so proficient was he in the higher mathematics, Latin, Greek and the modern languages, that he was



THEODORE H. VIDETO.

given a professorship in a New Brunswick seminary. After teaching there for 10 years he came to the United States for further study. In 1879, however, he forsook scholastic life, and began manufacturing light-weight solarized rubber clothing. His first position was with the Globe, later the Readville Rubber Co., "gossamer" rubber proofers. At this time all of these goods were plain black surfaced. Soon English rubber men began to send in beautiful sil-

vered "electric" garments, the effects gained by surfacing with potato starch. In attempting to imitate this, an American company, the Solarized Rubber Co., brought out garments in checks and stripes, but lost money and gave up the business. Mr. Videto, however, after much experimenting, evolved a cheap and simple process for producing what was known as the "India stripe." In 1886 he secured the assistance of L. D. Apsley, who was then operating the Goodyear Gossamer Co. at Hudson, Massachusetts, and entered his employ. Later he went to South Framingham with the Gossamer Rubber Co., where his son was employed as superintendent. Upon the death of Ira M. Conant, the founder of the business, he left and took an advisory position with the Conant Rubber Co. The "gossamer" garments once sold by the million, were, however, being rapidly displaced by light-weight calendered, vulcanized goods, and in time the Conant Rubber Co. went out of business.

Mr. Videto did not seek another engagement, but devoted the remainder of his life to study and public work.

For nine years he served as chairman of the Framingham school committee, and was chairman of the town's committee having charge of the construction of its new high school. He was a member of the board of trade, and of the town's committee on the separation of street and railroad crossings.

Mr. Videto was for many years a deacon of the First Baptist Church, Hyde Park, and was also deacon and clerk of the Park Street Baptist Church of Framingham. He was chaplain of Alpha Lodge of Masons, and belonged to Concord Royal Arch Chapter of Framingham. As a Knight Templar he was affiliated with the Natick Commandery. He was a charter member and past commander of Cyprus Commandery, Knights of Malta.

He married in 1857 Rebecca Homan Dodge, of Charleston, daughter of John and Sarah (Pedrick) Dodge. Four children survive, John F. Videto, Mount Vernon, New York; Nathaniel

E. Videto, Mrs. William Johnson, Framingham, Massachusetts, and Theodore E. Videto, Montreal, Canada.

MELVILLE HAZEN BARKER.

Melville Hazen Barker, general manager of the American Tool & Machine Co., Boston, Massachusetts, died on March 9 at his home in Dorchester, Massachusetts, after a short illness, of pneumonia. Mr. Barker was born in Bridgton, Maine, but when only three years old was taken West by his family, his early education being in the public schools of Chicago, after which he took an architectural course at the Wisconsin State University. Later he removed to Lawrence, Massachusetts, and became connected with the repair department of the Everett Mills, afterwards going into retail business. His store being burned out, he went to the repair department of the Atlantic Cotton Mills. In 1874 he became connected with the American Tool & Machine Co. and 20 years later became general manager, the position which he held at the time of his death. Mr. Barker was a charter member of the National Metal Trades Association and its president in 1907. He was a member of the Massachusetts Charitable Mechanics' Association, the City Club, Engineers' Club and Art Club, of Boston, and the Engineers' and Machinery Clubs of New York; also a Mason, an Odd Fellow and a Knight of Honor. He is survived by a wife and two children.

EDWIN R. HALL.

Edwin R. Hall, chief experimental engineer of the Goodyear Tire & Rubber Co., Akron, Ohio, died of pneumonia at Mt. Clemens, Michigan, March 17, where he had been taking treatments for rheumatism. Mr. Hall was born in Somerville, Massachusetts, in 1885, and educated in the grammar and



EDWIN R. HALL.

high schools of that city and at the Institute of Technology, from which institution he graduated as mechanical engineer in 1908, going directly to Akron to the Goodyear company in its experimental department, which he has seen develop from a one-man bureau to a department employing 125 men. He was very active in the Society of Automobile Engineers and the Clincher Automobile Tire Manufacturers' Association.

In the former organization he served on several committees and contributed a number of important papers, and at the time of his death was a member of the council of the Society and chairman of the Standards Committee. In the Clincher Automobile Tire Manufacturers' Association he was chairman of the Engineers Committee, and the present excellent condition of inspection, and satisfactory rims for

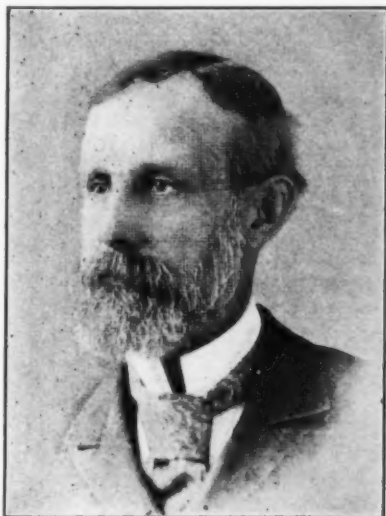
pneumatic tires in this country, is due largely to Mr. Hall's efforts. He was also a member of the University Club of Akron and of several Masonic bodies. Mr. Hall was acknowledged a man of keen perception in matters relating to mechanics and engineering practices, and his judgment along these lines was greatly respected. He is survived by a wife and two daughters.

JOHN HOPEWELL.

As we go to press word comes of the sudden death of John Hopewell in Washington, D. C., at the age of 71 years. Mr. Hopewell was one of the leaders in the industrial and financial

circles of New England.

He was born in Greenfield, Massachusetts, but spent his boyhood days at Shelburne Falls, removing to Springfield at the age of 21 and working on munitions at the armory there. A few years later he associated himself with the important firm of L. C. Chase & Co., Boston, Massachusetts, and five years later became a member of the firm, of which he was the senior member at the time of his death. He was formerly president of



JOHN HOPEWELL.

the Reading Rubber Manufacturing Co., Reading, Massachusetts, a director of the Sanford Mills, Sanford, Maine, a director of the First National Bank, Boston, and was connected with scores of other important corporations. He was a member of the Algonquin Club, the Boston Art Club, the Merchants' Club, the Boston Merchants' Association, the Boston Chamber of Commerce, the Boston Athletic Association, the Hunnewell, the Newton and the Brae-Burn Clubs. He also was a Mason. He was an active, public-spirited, shrewd man of affairs, and had a remarkably wide acquaintance with the leaders in American business. He leaves a widow, two daughters and three sons, one of whom, Frank B. Hopewell, is actively engaged in the L. C. Chase Co. and the Reading Manufacturing Co.

BENJAMIN L. ANDREWS.

Benjamin L. Andrews passed away Sunday, March 5, at his home in Beverly, Massachusetts, after an illness of several months' duration. Mr. Andrews was born at Essex, Massachusetts, on March 6, 1854. His first experience in rubber trade was with the Clifton Manufacturing Co., with which he worked for a short time as salesman for garments, but in 1894, desiring to enlarge his line, added some samples from the Globe Rubber Works of Boston, under a commission arrangement, and the next year he became the regular New England salesman for the Globe Rubber Works, which position he has held up to his death.

He was methodical in his habits, careful in his business dealings and anxious at all times to give service and satisfaction to his customers, all of whom he numbered among his personal friends. To many of them he was familiarly known as "Doctor." He was a member of Liberty lodge of

Masons, Amity chapter of Royal Arch Masons, St. George's commandery, Knights Templars; Aleppo temple, Mystic shrine: Bass River lodge of Odd Fellows and the Beverly Republican Club. He leaves a widow and one son.

ROBERT P. PARKER.

Robert P. Parker, who for several years was prominent in the bicycle business and for nine years in the employ of the Hartford Rubber Works Co. at Hartford, Connecticut, his home town, becoming sales manager and, later, New York branch manager for that company, died, aged 45 years, at his home in Pittsfield, Massachusetts, March 10. After leaving the rubber industry he removed to the latter mentioned city where he became prominent in insurance, real estate and building lines. He is survived by a wife and three children.

THOMAS KING.

Thomas King, who died recently at the New York Post Graduate Hospital, following an operation, was a veteran employee of the New York Belting & Packing Co. at its factory in Passaic, New Jersey. He was born in Norfolk, Virginia, in 1842, and during the Civil War was a member of the Ninth Virginia Cavalry. Coming north, after the war, he worked in the calender room of The Okonite Co., but for over 25 years has been with the first mentioned concern. He is survived by a widow and two sons, James and William E. King, both of whom are employed by the New York Belting & Packing Co. in its Passaic plant.

JAMES E. BAXTER

James E. Baxter, of the firm of J. E. Baxter & Co., Limited, rubber manufacturers, Leyland, England, died early in February, at his home at Farington, near Preston, Lancaster, England, at the age of 54 years.

Mr. Baxter's connection with the rubber industry began in 1874 with the old firm of Jos. E. Quinn & Co., of Leyland, which, through successive amalgamations, became the Leyland & Birmingham Rubber Co., Limited, with Mr. Baxter as chairman. After about 12 years in this capacity he resigned

in order to establish the concern of J. E. Baxter & Co., Limited, Leyland.

Mr. Baxter was a keen sportsman, and one of the first motor car owners in England. About 14 years ago he took his car to South Africa, making a business tour and paying special attention to the rubber requirements of the gold-mining firms there. It is believed that this arduous trip somewhat affected his health, and possibly may have had



JAMES EDGAR BAXTER.

something to do with his final illness. He was chairman of the Rubber Manufacturers' Association, Manchester, in 1901-1902, and was one of the first rubber manufacturers to take a practical interest in planting rubber in the East, at one time acting as a trustee of the Manchester & North Borneo Rubber Co.

DECEASED RUBBER JOURNALISTS.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

We have read with appreciation your sketch of the late E. Ule, whose death is a loss to the whole scientific world. In connection with it we have the impulse to mention other distinguished men connected with the "Tropenpflanzer," who have passed away within the twelvemonth. For example there was

RUDOLPH ENDLICH

one of the oldest of the "Tropenpflanzer's" contributors, who died in Ghent, Belgium, of appendicitis, while connected with the commissary department of the German army.

Mr. Endlich traveled extensively in Brazil, Paraguay and Argentina, and added to the botanic museum of Berlin a rich collection of exotic plants. His most notable contributions to the "Tropenpflanzer" were: "The Present Condition and the Future of the Guayule Industry" and "The Euphorbia Elastica—A New Rubber Tree"

As plantation manager for the Kilimandjaro Plantation Co. he spent three years in German East Africa, where he laid out a large *Manihot* rubber plantation.

KARL SUPP.

Founder and manager of the "Tropenpflanzer," who died on January 27, 1915, at the age of 59, was born in Nuremberg October 8, 1855, and came to Berlin in 1892. He founded the

Colonial Commercial Committee, which resulted in 1914 in an organization composed of German princes, scientific institutes, chambers of commerce and of agriculture, colonial and commercial corporations, workmen's unions, missions, etc., all with headquarters in Berlin and branches in German East Africa; an organization of not less than 1,100 commercial, industrial and scientific institutes, corporations and firms.

In 1906 he was prominent in the establishment of the

"cotton commission," and just previous to the war he did the largest part in organizing the production of this most important raw material in the German colonies.

Furthermore, there was

FRANTZ MATTHIESEN

general secretary of the German Colonial Commercial Committee and editor of the "Tropenpflanzer."

At the beginning of the war he was sent to Königsberg, and then to the frontier as officer of a reserve regiment. He was badly wounded in the chest and legs, and after receiving the Iron Cross died from his wounds in the hospital at Insternburg. He was born in Sablon (near Metz) June 5, 1878, and passed his youth in different parts of the annexed provinces where his father was called by his profession. He graduated in Metz and entered the Kommerz und Diskonto-Bank, Hamburg. After his military service he did not return to banking, but took up botanical work. After graduating as Doctor in Botany (Munich), he obtained employment with the Colonial Committee and later became editor of the "Tropenpflanzer."

ANALYSIS OF POWER COSTS.

THE following letter, of interest to manufacturers, has been sent to THE INDIA RUBBER WORLD by a superintendent whose wide experience in rubber factories renders his expression worthy of consideration:

TO THE EDITOR OF THE INDIA RUBBER WORLD:

Every rubber factory, to successfully compete and not suffer by competition, requires a cost system which will tell actual manufacturing costs with promptness and with accuracy. Cost finding is really a very simple matter if one will take the trouble to prepare a system to meet the special factory requirements and then see that the system is kept up.

Most people understand in a general way how to figure the cost of a job that consists principally of labor and material. They may, however, consider the problem difficult when the cost of power and machine time predominates over the wages of hand labor. From the case described below, it will be seen that when the method is once really understood, this problem resolves itself into a very simple matter.

For an example, let us take the milling and mixing of rubber. Making no attempt to give details, I submit the following practical description of the method that is in actual use.

Each purchase of material is manufactured as a separate lot and is so entered in the general as well as the stock ledger account. When entered for manufacture, each job is identified by a separate production number, and all materials and labor used on it are reported on stock requisition slips, or time slips.

All power costs, inclusive of fuel, repairs, depreciation, wages of foremen and engineers, are determined on a monthly basis. The total factory horse-power is divided into separate horse-power units and each power division is assigned an hourly rate in ratio to the total horse-power. It is thus possible to charge each production order with the cost of power employed. At the end of the month the totals of these power charges are checked by the actual power costs. This method is applicable only where it is possible to charge each job as a separate unit.

In the case of a process where it is impracticable to determine the power cost for any particular job, because several are in the works at the same time, the power item, together with superintendence and cost of cleaning machines and surroundings between jobs, are combined into a monthly total. The ratio which this sum bears to the monthly total of productive labor determines the proper amount to charge each job for power cost, according to its share of productive labor.

The foregoing essentials furnish the basis for a monthly statement of profit and loss which can be prepared without taking a physical inventory. In a well-ordered factory these figures for one month should be ready early the next month.

Efficiency is the keynote of present-day industry, and there can be no efficiency without organization. It is the work of the accountant to devise accurate and adequate systems of accounting which will automatically show leakages and fluctuations, thus organizing a business to indicate where costs may be decreased and efficiency increased. The day when a manufacturer can reasonably risk selling on "cost guesses" is over. A knowledge of production costs is absolutely necessary if dividends and surplus are to be maintained.

Under the ordinary plan of accounting, a physical inventory is taken once a year, the books are closed and profit or loss determined. The accuracy of the result is largely based on the correctness of the inventory. This brings about a condition of uncertainty and often exhibits results which come too late for remedy.

An adequate system of cost accounts, free from "red tape" and dealing only with essentials, is the only kind worth consideration. It should harmonize with the general records and provide a perpetual inventory with a statement of profit and loss rendered monthly. Price making by such a system is safe and intelligent. Losses are detected and eliminated, and profit substituted.



KARL SUPP.

The Annual Report of the United States Rubber Co.

THE annual report of President Samuel P. Colt, of the United States Rubber Co., was mailed to the stockholders early this month and shows a most satisfactory condition in the affairs of the company.

Among the interesting features may be noted the increased business of the company and the profits thereon. The net sales during 1915 were more than \$92,000,000, an increase of more than \$9,000,000 over those of the previous year, and as the prices of goods were less than during 1914, the increased volume of goods sold was proportionately greater than is indicated by these figures.

Regarding the net profits of the company, the figures for 1915 were over \$1,800,000 above those of 1914, a most excellent showing. Dividends were paid in full on the preferred stock, and one dividend, amounting to 1½ per cent, was paid upon the common stock.

As was decided the previous year, all export activities were brought under one department, and this move has proven advantageous, the export business during the year amounting to approximately 5 per cent of all the business done.

All will be interested in the note in Colonel Colt's report regarding preparedness. This shows that the company is among the foremost in fostering the movement to place this nation upon a proper basis to meet any international emergency.

It will be noted that the principal factory which is devoted to tires, has been doubled in capacity, while other plants have been enlarged and all are being operated to full capacity.

Last September the directors voted that the stockholders should be furnished hereafter with semi-annual instead of annual reports and, therefore, another report will be issued as of June 30.

The list of directors has been increased to 18 by the election of Edgar B. Davis, Brockton, Massachusetts, who, it will be remembered, was vice-president in charge of the General Rubber Co.'s plantations in Sumatra, and who has traveled extensively over the Malay Peninsula and adjacent territory. Mr. Davis is an authority on rubber planting and is a distinct acquisition to the directorate of the company.

President Colt's report is as follows:

To the Stockholders of the United States Rubber Co.:

In conformity with the by-law which provides that the president "shall make a report in writing to the stockholders at their annual meeting, reviewing the general business and condition of the company," your president submits the following as such report for the year 1915:

The treasurer's report, appended hereto, which is made a part hereof, gives the consolidated general balance sheet as of December 31, 1915, and the consolidated income statement for the year ended December 31, 1915, of the United States Rubber Co. and all its subsidiary companies.

FINANCIAL POSITION OF THE COMPANY.

As a proper safeguard and in view of the floating indebtedness of the company, the policy has been continued of carrying a substantial amount of cash.

During the past year the bonded indebtedness of the company has been modified as follows: Nine million dollars of debenture bonds of the General Rubber Co. (our crude rubber company), which fell due July 1, 1915, were paid by the issue of \$9,000,000 of 5 per cent debenture bonds of the same company, maturing December 1, 1918. Two and one-half million dollars of 5 per cent debenture bonds of the Canadian Consolidated Rubber Co., Limited (whose stock is largely owned by us), maturing December 1, 1918, were issued and sold, and three million dollars of an issue of five million dollars of 5 per cent debenture bonds of Morgan & Wright (our largest tire manufacturing company), maturing December 1, 1918, were sold—the proceeds of the two latter issues being used in reduction of the floating debts and for extensions of the plants of those companies.

The object of having these obligations mature December 1, 1918—that being the date of the maturity of our collateral trust 6's, which through sinking fund will then be reduced to \$15,000,000—is that then we may issue one class of security for such amount and on such time as then may seem desirable for the retirement of all these obligations.

VOLUME OF BUSINESS.

The net sales of the company for the year 1915 were \$92,861,015.98, as against \$83,678,812.05 the previous year, or an increase of about \$9,000,000. As the average selling price of rubber goods was less in 1915 than in 1914, the increase in volume of goods sold was proportionately greater than the increase in cash received therefor.

PROFITS AND DIVIDENDS.

The net profits from the business of the year, before deducting interest charges, amounted to \$11,486,704.53; after deducting interest charges the profits were \$8,696,089.15. These profits, if applied in full to dividends, would cover the dividends upon the preferred stocks, and leave a sum equivalent to about ten per cent upon the common stock. Full dividends upon the preferred stocks for the year were paid, and one and one-half per cent was paid upon the common stock in April, 1915. Any further application of profits to dividends under existing conditions would be most unwise and against the permanent interests of all our stockholders.

Indeed, notwithstanding that the earnings of the year have proved to be better than in last July they promised to be, the wisdom of the decision of your directors then made to suspend dividends upon the common stock has been fully justified. Owing to the European war many uncertainties have been created and still exist, notably the uncertainty as to the price of crude rubber and the hazards affecting its transportation to this country. In consequence of prevailing conditions, we have felt it incumbent to purchase a much larger stock of crude rubber than would be necessary in ordinary times, and this alone necessitates the employment of larger quick capital. Moreover, it is most desirable, in connection with the funding of our debt December 1, 1918, that we should continue to strengthen the financial position of the company.

DEPRECIATION.

In addition to maintaining the fixed properties of the company in the highest state of efficiency, and charging the cost of such maintenance to expense account, as heretofore, your directors have deemed it wise to apply to the reduction of certain fixed properties, \$2,000,000 of the \$7,000,000 reserved for depreciation, and have further charged \$1,175,479.62 against income on items existing prior to 1915.

BASIS OF INVENTORIES.

Following our usual practice, inventories of manufactured goods and materials have been taken at cost where cost was below market, and at market where market was below cost. Market value of crude rubber and other materials inventoried December 31, 1915, exceeded cost by a substantial amount.

UNITED STATES RUBBER EXPORT CO., LIMITED.

As stated in the report of last year, our export business has been largely consolidated under one organization, and is being satisfactorily expanded under the management of the able men in charge thereof. Our export business the past year has been approximately 5 per cent of our entire business.

UNITED STATES TIRE CO.

The organization of the United States Tire Co., under which we transact our tire business, has been recently enlarged and strengthened. In addition to the distribution of tires through the fifty-one branches of the United States Tire Co., provision has been made for a very much wider distribution than heretofore through the many stores of the United States Rubber Co. The addition to our former brands of tires of the new "Royal Cord" tire and the new non-skid "Usco" tire gives us the most complete line of tires manufactured by any company. Our well known "Nobby Tread" and "Chain Tread" are still having a wide and increasing demand, and are acknowledged the best non-skid tires in the market. Our tire sales for January and February of this year show a very large increase over the same period last year.

OUR SUMATRA RUBBER PLANTATIONS.

We have continued the further development of our rubber

plantations in Sumatra during the past year. The amount of crude rubber received therefrom in 1915 was relatively small compared with our requirements, but was in excess of previously estimated production. From now on the increase in production of our Sumatra estates will be rapid as the great number of young trees arrive at the bearing age. I cannot speak too strongly of the efficiency and loyalty of those in charge of our plantations, and so far all their predictions of success have been more than borne out, and the outlook for the future is most flattering.

PREPAREDNESS.

Your directors believe that the unselfish efforts of every corporation are needed to achieve adequate preparedness in the United States, whether for peace or defense. Accordingly they have approved of our employees joining the National Guard, and have agreed to give them the necessary time for camp and other military duties without prejudice to their salaries or to their positions with the company. It is also believed that through the fostering of trade associations and the cooperation of such associations much may be accomplished in the direction of industrial mobilization, without which true preparedness is impossible. Finding that the Navy Department of the United States was in need of some research work in aeronautics, but was without an appropriation for carrying on the investigation, your company volunteered to do this work for the government. This was done, and has proven a useful and practical contribution to preparedness.

THE OUTLOOK FOR THE FUTURE.

At no time in the history of our company has there been greater activity in its business. All our factories are now being operated at full capacity, and steps for enlargement of certain plants and for increase of production are being taken, and the work pushed forward with all dispatch. One of the plants now in process of enlargement is the tire factory of Morgan & Wright at Detroit. This work is under way, and when completed will double the capacity of that plant. Since the beginning of the year a property adjoining that plant has been acquired to better carry out this enlargement.

SEMI-ANNUAL REPORTS.

In accordance with the action taken by the directors on September 16, 1915, the stockholders will be furnished hereafter with semi-annual reports, as of June 30 and December 31.

CONCLUSION.

It again gives me much pleasure to refer to the continued fidelity and ability shown by the officers, heads of departments and employees of the company and its subsidiaries.

TREASURER'S REPORT.

UNITED STATES RUBBER CO. AND SUBSIDIARY COMPANIES.

Consolidated General Balance Sheet, December 31, 1915.

ASSETS.

| | |
|---|----------------------|
| Property, plant and investments, including rubber plantations. | \$126,347,930.90 |
| Inventories, manufactured goods and material. | \$39,768,295.77 |
| Cash | 13,102,407.57 |
| Notes and loans receivable. | 1,562,983.74 |
| Accounts receivable | 20,820,333.79 |
| Securities, including stock of U. S. Rubber Co. held by subsidiary companies. | 2,272,430.99 |
| Sinking fund cash in hands of trustees. | 476,251.32 |
| Miscellaneous | 2,200,809.32 |
| | <u>80,203,512.50</u> |

Total Assets\$206,551,443.40

LIABILITIES.

| | |
|--|------------------------|
| Capital stock, first preferred. | \$59,692,100.00 |
| Capital stock, second preferred. | 458,400.00 |
| Capital stock, common | 36,000,000.00 |
| | <u>\$96,150,500.00</u> |
| Capital stock, Rubber Goods Mfg. Co.— | |
| Preferred issued | \$10,351,400.00 |
| Owned by U. S. R. Co., deposited with trustees | 8,862,400.00 |
| | <u>1,489,000.00</u> |
| Common issued | \$16,941,700.00 |
| Owned by U. S. R. Co., deposited with trustees | 16,898,400.00 |
| | <u>43,300.00</u> |
| Minority Canadian Consolidated Rubber Co., Ltd., stock, preferred \$283,665.00, common \$206,535.00. | 490,200.00 |
| Ten-year 6% collateral trust sinking fund gold bonds U. S. R. Co. | 16,500,000.00 |
| General Rubber Co. debentures, 5% | \$9,000,000.00 |
| Ten-year 5% debentures, Eureka Fire Hose Mfg. Co. | 970,000.00 |
| Forty-year 6% collateral trust gold bonds, Canadian Consolidated Rubber Co., Ltd. | \$2,600,000.00 |
| Less owned by subsidiary company | 3,000.00 |
| | <u>2,597,000.00</u> |

| | |
|--|-------------------------|
| Canadian Consolidated Rubber Co., Ltd. | |
| 5% debentures | 2,500,000.00 |
| Morgan and Wright— | |
| 5% debentures | \$5,000,000.00 |
| Owned by U. S. R. Co. | 2,000,000.00 |
| | <u>3,000,000.00</u> |
| Mechanical Rubber Co. and New York Belting and Packing Co. bonds | 791,000.00 |
| | <u>18,858,000.00</u> |
| Notes and loans payable. | 19,939,709.23 |
| Acceptances for importation of crude rubber. | \$1,135,601.08 |
| Merchandise accounts payable | 6,111,514.27 |
| Accrued interest, taxes, etc. | 494,738.92 |
| | <u>7,741,854.27</u> |
| Reserved for dividends. | 1,200,718.00 |
| Insurance fund reserve. | \$809,499.27 |
| Employees' accident fund. | 286,110.06 |
| | <u>1,095,609.33</u> |
| Reserve for depreciation. | 5,000,000.00 |
| Fixed surpluses (subsidiary companies) | 15,080,230.78 |
| *Surplus | 22,962,321.79 |
| Total Liabilities | <u>\$206,551,443.40</u> |

*Of this surplus \$223,556.55 pertains to minority stock interests.

CONSOLIDATED INCOME STATEMENT FOR YEAR ENDING

DECEMBER 31, 1915.

| | |
|--|------------------------|
| Net sales, footwear, tires, mechanical and miscellaneous. | \$92,861,015.98 |
| Less: | |
| Cost of manufacture, selling, general expenses and taxes. | 79,243,881.84 |
| Operating profits | <u>\$13,617,134.14</u> |
| Other income (net) | 193,783.92 |
| Total income | <u>\$13,810,918.06</u> |
| Less: | |
| Cash discount allowed customers for prepayment (net) | \$1,766,659.77 |
| Deductions for bad debts. | 375,252.85 |
| Federal income tax, 1915. | 182,300.91 |
| | <u>2,324,213.53</u> |
| Net income prior to interest charges. | <u>\$11,486,704.53</u> |
| Interest on loans, notes and accounts payable. | 1,083,927.72 |
| Interest on funded debt. | 1,706,687.66 |
| Net Profits | <u>\$8,696,089.15</u> |
| Income credits applicable to period prior to 1915. | 836,971.31 |
| | <u>\$9,533,060.46</u> |
| Income charges applicable to period prior to 1915. | 1,175,479.62 |
| Net Income | <u>\$8,357,580.84</u> |
| Dividends—United States Rubber Co. | |
| 1st preferred, 8% | \$4,764,632.00 |
| 2d preferred, 6% | 30,906.00 |
| Common (April), 1½% | 540,000.00 |
| | <u>\$5,335,538.00</u> |
| Dividends to minority stockholders of subsidiary companies | 139,995.00 |
| | <u>5,475,533.00</u> |
| Surplus for period | <u>\$2,882,047.84</u> |
| Surplus beginning of period. | \$20,005,322.75 |
| Additions to surplus: | |
| Capital gain in conversion of second preferred into first preferred stock. | 25,000.00 |
| Adjustment applicable to prior year. | 49,951.20 |
| | <u>20,080,273.95</u> |
| Surplus, December 31, 1915. | <u>\$22,962,321.79</u> |

Respectfully submitted,
W. G. PARSONS, Treasurer.

ANNUAL ELECTION.

BOARD OF DIRECTORS FOR 1916.

The annual meeting of the stockholders of the company was held at New Brunswick, New Jersey, March 22, and the following directors were elected:

Walter S. Ballou, Providence, R. I.
James C. Brady, New York City.
Nicholas F. Brady, New York City.
Middleton S. Burrill, New York City.
Samuel P. Colt, Providence, R. I.
Harry E. Converse, Boston, Mass.
Edgar B. Davis, Brockton, Mass.
James Deshler, New Brunswick, N. J.
James B. Ford, New York City.
Francis L. Hine, New York City.
Henry L. Hotchkiss, New Haven, Conn.
Lester Leland, Boston, Mass.
Samuel M. Nicholson, Providence, R. I.
Raymond B. Price, New York City.
Homer E. Sawyer, New York City.
William H. Truesdale, Greenwich, Conn.
Theodore N. Vail, Boston, Mass.
Elisha S. Williams, New York City.

OFFICERS.

At a meeting of the board of directors on March 23 the following officers were elected for the ensuing year:

Samuel P. Colt, president.
James B. Ford, vice-president.
Lester Leland, vice-president.
Raymond B. Price, vice-president (Development Department).
Homer E. Sawyer, vice-president (Footwear Department).
Elisha S. Williams, vice-president (Mechanical Department).
J. Newton Gunn, assistant to president.
Samuel Norris, secretary.
John D. Carberry, assistant secretary.
W. G. Parsons, treasurer.
E. J. Hathorne, assistant treasurer.

EXECUTIVE COMMITTEE.

Samuel P. Colt, James B. Ford, Lester Leland, Walter S. Ballou and Nicholas F. Brady.

MEETING AND BANQUET OF NATIONAL ASSOCIATION OF WASTE MATERIAL DEALERS.

THE third annual meeting of the National Association of Waste Material Dealers was held at the Hotel Astor, New York City, March 15. President Louis Birkenstein called the meeting to order at 11 A.M. The minutes of the last meeting and the reports of the secretary and treasurer were read and approved.

The chairmen of the different divisions then submitted reports that reflected the very favorable conditions now existing in the trade. The Rubber Scrap Division recommended certain changes in the circular for packing which will be revised and hereafter known as Circular B. Item No. 4, covering standard automobile tires, now reads practically as follows: "Must be free of unguaranteed tires, heavy beaded tires, filled tires, burned or overcured and oxidized, single tube, stripped, badly worn, leather or metal."

The report of the committee to arrange for new and larger quarters reported the establishment of new offices at 185 Summer street, Boston, Massachusetts. The invaluable service rendered by the traffic committee during the past year was called to the attention of the members by the president, and a vote of thanks extended to the chairman for his good work. President Birkenstein and Secretary Haskins then read their annual reports, which were received with marked appreciation and approved in due form.

The nominating committee then submitted the following ballot for officers and directors for the ensuing year:

Louis Birkenstein, president; H. H. Cummings, first vice-president; James Rosenberg, second vice-president; William Van Der Koogh, third vice-president; Edward A. Stone, fourth vice-president; Henry Lissberger, fifth vice-president; Newell J. Lewis, sixth vice-president; Chas. M. Haskins, secretary; Mark Sherwin, treasurer. Directors: Simon Weil, Leo Loeser, F. W. Reidenbach, R. D. Cunningham, Herman Sonken, Ike Grodin, R. M. Milligan, Paul Loewenthal, Ivan Reitler.

The secretary was authorized to cast one ballot for each of the selections made, which he did, and the president declared elected the officers and directors as nominated.

Thus the third year of the National Association closed with most gratifying results to everyone. The association now has 110 members and has accomplished inestimable benefit for the waste trade, showing a development in growth and influence that has been felt in every branch of the business. Much praise is due the worthy president of the association, Louis Birkenstein, now elected for the third time. Much credit is due him for the progress, growth and accomplishment during the past year, and it is a source of satisfaction that Mr. Birkenstein has consented to serve for the ensuing year.

THE BANQUET.

In the evening about 230 members and guests assembled in the north ballroom of the Hotel Astor to participate in the third annual banquet. The hall was appropriately decorated with American flags and the flowers and table decorations tastefully arranged. Each member and guest received a souvenir in the shape of a small silk American flag.

There was orchestral music, popular songs and a mixed quartette to entertain the company while the courses were served. Following President Birkenstein's address, the speaker of the evening, Nathaniel Elsberg, congratulated the members on the success of the association.

Interesting talks were given by other speakers, who entertained the members until the small hours of the morning. The banquet was pronounced a most enjoyable affair by everyone there.

MANUFACTURERS OF TIRE FABRICS EXPAND.

The recent expansion of the Connecticut Mills Co. and Canadian Cotton Mills, Limited, again emphasizes the steady growth of these allied concerns. The Connecticut Mills Co. was organized in 1910 at Danielson, Connecticut, and the Canadian Connecticut Cotton Mills, Limited, controlled by the same group, followed in 1913. Each year since the Connecticut Mills Co. was first put into operation it has been found necessary to make extensions in the plant to accommodate increasing business.

The reorganization of the Connecticut Mills Co. has just been effected, whereby the capital becomes \$1,000,000, and provision has been made for a thirty-thousand-spindle spinning plant, which, however, will only supply a part of the Connecticut Mills Co.'s requirements. Other units will follow later at Danielson, Connecticut, where the company's plant is located, and is the largest factory in the town.

The Canadian Cotton Mills, Limited, located at Sherbrooke, Province of Quebec, has just had its capital increased to \$1,500,000 to finance an extension, tripling the capacity of the plant in anticipation of the future of Canada. The Sherbrooke company does all of its own spinning and enjoys the distinction of being at the same time the youngest member of the manufacturing circle of that city, and the largest. The products of both of these mills have been foremost in the market on the score of quality and are favorably known to every large user.

The men directing the affairs of both companies are Tracy S. Lewis, R. J. Caldwell, H. L. Burrage and O. Butler. To this staff has just been added the name of L. W. Cuddy, formerly of New Bedford. The selling agent is R. J. Caldwell of 15 Park Row, New York City.

The Dunlop Rubber Co. has recently completed the installation of a tire manufacturing plant at Melbourne, Australia, said to be the largest in the southern hemisphere. It is stated this plant will employ 1,400 hands, and it will manufacture many of the English specialties of the parent company.



LOUIS BIRKENSTEIN.

News of the American Rubber Trade.

ANNUAL STATEMENT OF THE HOOD RUBBER CO.

THE annual statement, recently issued, shows the condition of the company on December 31, 1915. The important items are given in the condensed balance sheet shown below:

CONDENSED BALANCE SHEET. December 31, 1915.

| ASSETS. | |
|---|-----------------------|
| Plant (real estate, machinery, etc.)..... | \$2,425,000.00 |
| Merchandise | 1,361,820.30 |
| Accounts receivable | 3,138,887.99 |
| Cash | 238,341.98 |
| Investments in other corporations..... | 189,800.00 |
| Patents | 1,000.00 |
| | \$7,354,850.27 |
| LIABILITIES. | |
| Capital Stock—Common | \$2,000,000.00 |
| —Preferred | 2,500,000.00 |
| | \$4,500,000.00 |
| Notes payable | 1,580,000.00 |
| Surplus | 1,274,850.27 |
| | \$7,354,850.27 |

Merchandise in process of importation and letters of credit in connection therewith are not included in the foregoing statement.

MIDGLEY COMPANY CHANGES NAME AND ENLARGES CAPITAL.

At a special meeting of the stockholders held recently, the name of the Midgley Tire & Rubber Co., of Lancaster, Ohio, was changed to the Lancaster Tire & Rubber Co. The capital stock was increased from \$550,000 to \$850,000, the increase being 7 per cent. cumulative stock.

The new directors are:

F. A. Miller, Columbus, Ohio, general manager of the H. C. Godman Shoe Co.

H. B. Peters, Lancaster, Ohio, president of the Fairfield National Bank.

C. S. Hutchinson, Lancaster, Ohio, assistant secretary of the H. C. Godman Shoe Co. and vice-president of the Lancaster National Bank.

Harry Davis, Pittsburgh, Pennsylvania, president of the Harry Davis Enterprises.

E. E. Lerch, Columbus, Ohio, secretary of the H. C. Godman Shoe Co.

H. V. Blaxter, Pittsburgh, Pennsylvania, of Lazier & Blaxter, attorneys at law.

J. T. Rose, Lancaster, Ohio, president of the Lancaster Tire & Rubber Co.

The officers of the company are:

J. T. Rose, president.

C. S. Hutchinson, vice-president.

G. A. Stephenson, secretary and treasurer.

Walter H. Hermann, factory manager.

T. B. Davies, manager of sales.

Orders for additional equipment for the making of full molded tires have been placed; presses have been purchased, and within the next 60 days the company will be producing, in addition to its present product, wrapped wire tread and plain tread tires, full molded plain and non-skid tires and a complete line of inner tubes.

CANADIAN CONSOLIDATED RUBBER CO. ACTIVITIES.

During the past month a shipment of 1,000 hot water bottles was sent by the Canadian Consolidated Rubber Co., Montreal, Canada, to the Queen's secretary at Buckingham Palace, London, England, for distribution through the military hospitals of England. These bottles were provided from the proceeds of a special fund instituted through the efforts of Mrs. L. Mitchell-Henry, of Montreal, and funds for further shipments are being collected. This company has reopened and remodeled the factory of the Granby Rubber Co., Granby, Quebec, for the manufacture of a

general line of rubber footwear. C. K. Hutchinson is factory manager.

GOODRICH ANNUAL MEETING.

At the annual meeting of stockholders of The B. F. Goodrich Co., held at the company's office in New York City on March 8, the following five directors whose term expired this year were re-elected for a period of three years: C. C. Goodrich, F. H. Mason, W. A. Means, A. H. Noah and Guy E. Norwood. Provision was made for four additional directors, increasing the board membership from 14 to 18. The following directors were elected to fill the new places on the board, also the vacancy caused by the resignation of A. H. Wiggin: W. O. Rutherford, A. B. Jones, Dr. W. C. Geer, H. E. Joy, H. K. Raymond. The directors also re-elected the old officers.

The stockholders in a special meeting authorized the reduction of the authorized preferred capital stock from \$28,000,000 to \$27,300,000.

The quarterly dividend of 1 per cent on the common stock was declared, payable May 15 to stockholders of record May 4.

RUBBER COMPANY DIVIDENDS.

The Boston Woven Hose & Rubber Co. paid the regular dividend of 3 per cent on March 15 to stockholders of record March 6.

The usual quarterly dividend of 1¼ per cent on the preferred stock of the Republic Rubber Co. was paid March 1.

The Rubber Goods Manufacturing Co. paid the regular quarterly dividend of 1¼ per cent on its preferred stock March 15 to stockholders of record March 10.

A quarterly dividend of 1¼ per cent on the preferred stock of the Plymouth Rubber Co. was paid March 1.

A quarterly dividend of 1½ per cent on the 6 per cent preferred stock of the Kelly-Springfield Tire Co. has been declared, payable April 1, to stockholders of record March 18.

The Goodyear Tire & Rubber Co. has declared a quarterly dividend of 1¼ per cent on its preferred stock, payable April 1.

The regular quarterly dividend of the Boston Belting Co., \$2 a share, will be paid on April 1.

The Firestone Tire & Rubber Co. has declared a quarterly dividend of 1¼ per cent on preferred and 5 per cent on common stock, both payable April 15 to stockholders of record April 1.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of shares of rubber manufacturing companies on March 25 are furnished by John Burnham & Co., 115 Broadway, New York City, and 40 South La Salle street, Chicago, Illinois:

| | Bid. | Asked. |
|---|------|--------|
| Ajax Rubber Co. (new)..... | 68½ | 70¼ |
| Firestone Tire & Rubber Co., common..... | 74½ | 75½ |
| Firestone Tire & Rubber Co., preferred..... | 113 | |
| The B. F. Goodrich Co., common..... | 72½ | 73½ |
| The B. F. Goodrich Co., preferred..... | 114 | 116 |
| Goodyear Tire & Rubber Co., common..... | 340 | 345 |
| Goodyear Tire & Rubber Co., preferred..... | 112 | 116 |
| Kelly-Springfield Tire Co., common..... | 74½ | 75½ |
| Kelly-Springfield Tire Co., common (new)..... | | |
| Kelly-Springfield Tire Co. first preferred..... | 96 | 98 |
| Kelly-Springfield Tire Co., second preferred..... | | |
| Miller Rubber Co., common..... | 234 | 240 |
| Miller Rubber Co., preferred..... | 112 | 116 |
| Portage Rubber Co., common..... | 70 | 72 |
| Portage Rubber Co., preferred..... | 106 | 107 |
| Rubber Goods Manufacturing Co., preferred..... | | |
| Swinhart Tire & Rubber Co..... | 88 | 90 |
| United States Rubber Co., common..... | 53½ | 52¾ |
| United States Rubber Co., preferred..... | 109 | 111 |

WILLIAM J. KELLY.

HAS anybody here seen Kelly?

In response to this orchestral query, a big-boned, rangy American, with a look of eager youthfulness contradicting the gray in his close-clipped hair, rises, bows to right and left, and one of the old-time customs of a Rubber Club dinner is complete. Needless to say this is William J. Kelly, known to the rubber trade far and wide.



WILLIAM J. KELLY.

To quote one of his own biographical phrases: "I came within three days of being born a fool," which means that he first saw the light on April 4, the year being 1861. His home was in Old Roxbury, Massachusetts, just a few doors from that of the late Charles H. Arnold.

It was quite natural, as the boys grew up together and attended the same schools, that when they came together in business later in life, there should have been a very strong bond of affection between them.

Young Kelly showed his first interest in rubber when as a boy he often strayed to the Boston Belting Co.'s factory in Roxbury, and wheedled bits of pure rubber from the workmen to use as chewing gum.

In 1880 he secured a position with Henry A. Gould in his Boston office. Later he went with Geo. A. Alden & Co., and in 1903 became associated with his old friend Charles H. Arnold, first as a rubber salesman, and a successful one, and later as a member of the firm of Arnold & Zeiss. He is known from one end of the country to the other, is popular, respected and successful. Incidentally, Mr. Kelly is something of a golfer, an enthusiastic baseball fan, and one of the fathers of the Rubber Club.

AN IMPORTANT TRADE-MARK DECISION.

The decision of the District of Columbia Court of Appeals in sustaining the decision of the commissioner of patents in *ex parte* United Drug Co., according to the "Bulletin of the United States Trade-Mark Association," establishes a precedent which may easily be the cause of far-reaching confusion in commercial fields as to what constitutes unfair competition. The United Drug Co. attempted to register the word "Stork" as a trade-mark for rubber nipples, and the commissioner refused registration because of the existence of the Stork Co., a corporation engaged in the manufacture of waterproof goods, although the latter company does not make rubber nipples and does not oppose the registration of the word by the United Drug Co.

The American consulate at Mombasa, Africa, desires to receive from American manufacturers and exporters, catalogs of rubber goods for its commercial library and reading room.

PERSONAL MENTION.

Harvey S. Firestone, president of the Firestone Tire & Rubber Co., Akron, Ohio, left for Florida late last month, where he will remain for a few weeks.

W. H. Bell has been made manager of the Chicago, Illinois, district by the Kelly-Springfield Tire Co., New York City, having formerly managed the company's Pacific Coast territory.

J. E. Redman has been made assistant sales manager of the Chicago, Illinois, territory by the Michelin Tire Co., Milltown, New Jersey.

Frank C. Stover, formerly of the Star Electric Co., Chicago, Illinois, has been appointed manager of the municipal department of the United States Tire Co., with headquarters at 1222 Michigan avenue, Chicago.

Franklin Kesser, well known in the tire trade, has recently become Eastern district manager of the Batavia Rubber Co., with headquarters at their New York branch, 1906 Broadway. Mr. Kesser's experience covers a period of ten years as manager of the Hartford Rubber Works Co.'s branch in Philadelphia; five years in an executive capacity at the Hartford factory; three years in executive positions with Akron tire companies, and for the past year jobbing representative of the Batavia Rubber Co. for the Philadelphia market, which experience entitles him to be called one of the deans in the tire world.

Ernest Brandt has become connected with the Ajax Rubber Co., Inc., New York City, to assist J. C. Matlack in the conduct of the sales department. Mr. Brandt was with the Hartford Rubber Works Co. for many years, later joining the Fisk Rubber Co. in an important capacity. He then became sales manager of the Corbin Motor Vehicle Co., was one of the district managers of the United States Motor Co., and, still later, eastern district manager for the Hudson Motor Car Co.

Charles G. McCullough, New York manager for the Pennsylvania Rubber Co., Jeannette, Pennsylvania, is engaged to marry Miss Isabelle Matlack, daughter of J. C. Matlack, sales manager of the Ajax Rubber Co., Inc., New York City.

E. B. Sigerson has been appointed manager of the Buffalo branch of the Goodyear Tire & Rubber Co., Akron, Ohio. In 1910 Mr. Sigerson joined the Goodyear forces as salesman in the New England district. Since then he has risen by rapid stages to his present post.

FOUNDER OF BATAVIA RUBBER CO. RETIRES.

Ashton W. Caney, president and active manager of the Batavia Rubber Co., Batavia, New York, and one of the original incorporators, retired from an active position with the company on March 1, having sold the greater portion of his stock. He will, however, still be connected with the company as a member of the board of directors.

Mr. Caney came to Batavia 29 years ago, and has been a prominent figure in its industrial affairs ever since. He has been actively engaged in the rubber industry for 17 years. In 1900 he became interested in the Batavia Rubber Tire Co., introducing the Sweet patent solid rubber carriage tire. The business was successful and in connection with the Batavia Carriage Wheel Co. it was sold to the Standard Anti-Friction Co. of New York. Mr. Caney remained with the latter company until August 1, 1902, when he resigned as manager of the rubber department and, with other Batavians, organized the Sweet Tire & Rubber Co., of Batavia. In 1908 the property of this company was sold to a representative of the present Batavia Rubber Co., which was formed by Mr. Caney, and a number of other officers of the old concern.

BLOOMINGDALE RUBBER CO. BUYS S. & L. PLANT.

The Bloomingdale Rubber Co., reclaimers, with general offices in the Singer Building, New York City, and works at Butler, New Jersey, purchased on December 17, 1915, at receiver's sale, the entire plant and assets of the S. & L. Rubber Co., Chester, Pennsylvania, for \$34,825, estimated to be one-third the actual value of the plant.

The Chester plant has a capacity of eight to ten tons per day, according to the kind of scrap reclaimed. It is located on the Delaware River and occupies an area 180 x 1,400 feet, adjoining the Pennsylvania and the Philadelphia & Reading railroad tracks, sidings from both roads running into the grounds of the plant. The Bloomingdale company's business having outgrown its Butler establishment, it is intended to run both plants. Alterations at Chester are now completed and the plant is running 20 hours a day.

AMERICAN CHICLE CO.

The full list of officers recently chosen by the directors of the American Chicle Co. includes Darwin R. James, president; Silas B. Adams, vice-president; M. D. Bromberg, secretary; F. A. Hubbard, treasurer. Walter Bauer is general manager, in charge of production, and George W. Hopkins, formerly vice-president of the Loose-Wiles Biscuit Co., has taken the position of general sales and advertising manager. This company manufactures over 100 brands of chewing gum, having factories in 10 American cities, and one each in Toronto, Canada, and London, England. It owns its chicle plantations, located in Yucatan.

AN INNOVATION IN SALES PLANS.

The United States Rubber Co., New York City, is equipping its footwear salesmen with an outfit which should prove of interest to all their customers. A neat package contains a folding stereoscope of aluminum and two sets of photographs, one of which comprises views taken at one of the large footwear factories of the company, and showing every process in detail of manufacturing boots and shoes. The other set represents a little journey to the National India Rubber Co.'s factory and illustrates the manufacture of sporting and outing shoes. Each of these sets consists of 50 stereoscopic views, and these are accompanied by a little address which the salesman is supposed to deliver in explanation of the photographs as they are presented one after another in the stereoscope. This practically takes the customer through the mills, showing him exactly each step in manufacture, and is really almost as good as a journey to Naugatuck, Malden, New Haven, Bristol, or to some other mill of the company. It should certainly hold the customer's attention and enlarge his knowledge of the "how" of rubber footwear production. As a selling proposition, it is an experiment which will be watched by manufacturers in other lines of business, with a view to determining its success.

RUBBER SOLED SHOES SAVED A LIFE.

A peculiar accident is reported in a technical paper on "Safety in Stone Quarrying," issued by the Bureau of Mines, Washington, District of Columbia. A transformer supplying a stone quarry burned out, permitting 4,000 volts to pass to the hoisting motors. The man in charge placed his hand on the lever, and as the machine was electrically charged he could not let go. As he was wearing rubber-soled shoes he sustained no injury. He called for help, and the man who came to his assistance, instead of pulling the switch and cutting off the current, took hold of the engineer's hands and tried to pull them free, and in so doing completed the circuit and was killed. The man with the rubber-soled shoes was uninjured except for slight burns.

TRADE NOTES.

The Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut, has leased the entire building at 106 Duane street, New York City, for their New York office, having formerly occupied only a part of it. The extended quarters will be thoroughly remodeled.

To care for its growing business in Canada, the F. S. Carr Co., Boston, Massachusetts, has purchased the factory property, including equipment, formerly owned by the Walpole Rubber Co., Limited, Granby, Quebec.

The Southwark Foundry & Machine Co., Philadelphia, Pennsylvania, has nearly quadrupled its capacity and is now very busy, especially in the manufacture of hydraulic presses and turbines. Machinery costing \$250,000 has already been installed and about as much more is contracted for, in order to bring the plant up to its proposed capacity.

J. E. Gramlich, formerly engineer and superintendent of the Chase Motor Truck Co., Syracuse, New York, has become associated with the Thermoid Rubber Co., Trenton, New Jersey, as engineer. Mr. Gramlich will give exclusive attention to the development of the lately patented Thermoid-Hardy Laminated Disk, for which this company has the exclusive American rights.

The Ideal steering device, a recent addition to the numerous specialties designed for Ford cars, is made by Charles E. Miller, Anderson Rubber Works, Anderson, Indiana.

A contract has been awarded to the New Jersey Car Spring & Rubber Co., Jersey City, New Jersey, by the fire department committee, Pittsfield, Massachusetts, for 1,100 feet of hose, at a price of 67 cents a foot.

The number of stockholders of the United States Rubber Co., New York City, on January 15 totaled 16,636, as compared with 15,572 on January 15, 1915.

The Aetna Rubber Co., Cleveland, Ohio, has sold its Perkins avenue property to the Ford-Clark Co., and will build a new plant on East Seventy-ninth street. The foundation is started, and the plans are for a three-story building 55x140 feet, with an addition of 50x60 feet. The new factory will be equipped with the latest improved type of machinery for the manufacture of electricians' and acid-proof gloves.

The De Silva Rubber Co., 310 East Seventy-fifth street, New York City, manufacturer of rubber heels and other mechanical goods and specialties, is building a two-story factory, 60x70 feet, on Harris avenue, Long Island City, New York.

The Canton Rubber Co., Canton, Ohio, has recently removed its New York City offices from 1326 Broadway to quarters at 240 Broadway, where the premises now occupied are three times the size of the former offices. L. P. Jones is manager.

The Warren Cotton Mills, West Warren, Massachusetts, will erect a two-story addition to its dyehouse and make alterations on the adjoining building. The addition will be approximately 114 x 36 feet; the foundation will be of concrete, and there will be a reinforced concrete floor and a tar and gravel roof. Work will be started immediately and will be completed within about two months. This corporation manufactures, besides other cotton fabrics, goods for mackintosh linings, etc.

Canadian Consolidated Rubber was selling at 91 when the war started, and there it remained until the middle of the month, when 99 was bid and 105 asked, with no sales reported. The last dividend on the common was paid October 1, 1914, and it is thought that the unusual demand for its products, in the regular trade, as well as its army contracts, make this rise in the value of its stock justifiable. The annual meeting takes place early next month.

PERSONAL MENTION.

David L. Kubie, son of Samuel Kubie, president of the Raw Products Co., has been elected secretary and director of the company. Mr. Kubie was formerly identified with the Raw Products Co., but resigned for the purpose of making an outside connection. His preference for the rubber business was stronger than for any other line, consequently he has returned to the fold. He will represent his father in a great many transactions to which Samuel Kubie previously had to give personal attention. The young man matriculated at the Wharton School of Finance, University of Pennsylvania. He made an excellent record from both a scholastic and athletic standpoint.

A party, consisting of directors and guests of the Atlantic Coast Lumber Corporation and United Timber Corporation, including Colonel Samuel P. Colt, Francis Lynde Stetson, James B. Ford, Lester Leland, John D. Carberry, M. J. Quinn, R. J. Clifford, E. J. Hathorne, Walter S. Ballou, H. Stuart Hotchkiss, United States Senator LeBaron B. Colt and Edgar B. Davis, left last week in private cars over the Pennsylvania Railroad via Atlantic Coast Line, for Georgetown and Charleston, South Carolina, on a tour of inspection of the various properties in South Carolina in which they are interested.

George B. Hodgman of the Hodgman Rubber Co., Tuckahoe, New York, returned March 21 from a three-weeks' visit to Bermuda.

John Scott McClurg, president and general manager of the McClurg Rubber Co., Coshocton, Ohio, was married on February 23 to Mrs. Anna Barry Cunningham.

W. H. Palmer, for several years in charge of the advertising department of the United States Rubber Co., New York City, has assumed a new position in the sales department and will devote his efforts to the development of the canvas rubber sole shoes manufactured by the company. L. E. Seddon, formerly assistant cashier, succeeds Mr. Palmer as manager of the advertising department.

The New Jersey Zinc Co., New York City, announces the appointment of A. H. Peck as sales manager, in place of Alfred W. Dodd, resigned, and E. V. Peters as assistant general sales manager.

Announcement has been made of the promotion of A. M. Jack to manager of the Pittsburgh branch of The B. F. Goodrich Co. Mr. Jack, whose home is in Dayton, Ohio, was engaged in newspaper work several years. For six months he was court reporter for the old "Dayton Press"; later he did reportorial work in Cincinnati for eight years. Ten years ago Mr. Jack was admitted to the Ohio bar, and he has been employed by the Goodrich company for the past five years, during which time he has made steady advance to his present position as manager of the Pittsburgh office of the company.

J. E. Duffield has become identified with the United States Rubber Co. interests as sales manager for the Mechanical Rubber Co., Chicago, Illinois. Mr. Duffield's activities as western manager for the Thermoid Rubber Co. have made him well known in Chicago.

W. F. Bilger, for a number of years advertising manager of the T. Eaton Co., Limited, Toronto, Canada, succeeds R. W. Ashcroft as advertising manager of the Canadian Consolidated Rubber Co., Limited, Montreal.

Nathan Owitz, sales department of the Wheeler Condenser & Engineering Co. of Carteret, New Jersey, has been elected sales manager of the J. P. Devine Co. of Buffalo, New York.

Mr. Owitz has been with the Wheeler company for 11 years; 5 years at their general office and works at Carteret, 2 years as manager of their Cincinnati district, 2 years as their Pittsburgh district manager, and manager of the Philadelphia territory for

1914 and 1915, handling their entire line of equipment; an experience which will qualify him for his new position.

Frederick C. Hood, vice-president and general manager of the Hood Rubber Co., Watertown, Massachusetts, will spend a few weeks at Bermuda early in April.

Dr. Eugenio Dahne, who has planned a remarkable exhibit of Brazilian products at the Panama-California Exposition, San Diego, California, leaves on the "Vestris" for Brazil on April 1. The doctor has been somewhat handicapped by the blocking of the Panama Canal. Only a part of the notable exhibit has arrived, therefore, with characteristic energy, he is going after it, and undoubtedly he will come back with shiploads of coffee, rubber and a great variety of interesting Brazilian products.

William L. Wadleigh, of Wadleigh Co., Limited, Singapore, Straits Settlements, who has been in Malaya since November of last year, starts for home April 8 by the Pacific route. He ought to arrive in New York by the first of May, and will certainly receive a warm welcome from his many friends.

Russell W. Earle has retired from the firm of Earle Brothers, crude rubber dealers, 66 Broad street, New York City. The business will be continued at the same location, under the same firm name, by William P. Earle, Harry W. Laird, William P. Earle, Jr., and Everett W. Laird.

J. F. Douse, for many years in the tire business with headquarters in San Francisco, California, recently assumed the management of the Seattle, Washington, branch of the Fisk Rubber Co., Chicopee Falls, Massachusetts.

RUBBER MEN ESCAPE IN SUSSEX DISASTER.

Among the passengers on the steamer *Sussex*, damaged by explosion in the English Channel, were Edward H. Huxley, president of the United States Rubber Export Co., and Francis E. Drake, European manager of that company, both of whom had exciting experiences. We are pleased to record that both gentlemen escaped injury. Mr. Huxley gave one of the clearest and most graphic accounts published of the explosion and the excitement which followed, and the many details mentioned by him show him to be a close observer. His story of the affair was cabled by the Associated Press to all the leading papers in this country.

Another passenger on the *Sussex*, who, however, did not escape so easily, was Joshua D. Armitage, of Taylor, Armitage & Co., of New York City. Great anxiety was felt by his partners and friends at first, because of the absence of any word regarding him, but later reports stated that he was suffering from shock and bruises, but was not seriously injured.



EDWARD H. HUXLEY

BRAZIL AIDS TRAVELLING SALESMEN.

The annoying delay occasioned by the customs officials of Brazil in entering and releasing traveling men's samples is well known to the fraternity. Recent legislation has been enacted through the efforts of Ambassador Morgan, whereby in place of the usual duty, 5 per cent is levied on the value of the samples according to the accompanying consular invoice. Advertising samples will pay regular duties less 50 per cent.

The Fifth National Textile Exhibition will be held in Mechanics' Building, Boston, April 24 to 29, and the National Association of Cotton Manufacturers will hold its 100th meeting at Copley Plaza Hotel during the same week. Many men well known to tire manufacturers will participate.

NEW INCORPORATIONS, WITH AUTHORIZED CAPITAL, ETC., 1916.

Amazon Tire & Rubber Co., The., February 29 (Ohio), \$100,000. Louis J. Shott, C. E. Bettler, L. F. Smith, E. H. Clinedinst and Frank B. Burch.

American Aircraft Co., Inc., March 21 (New York), \$10,000. Ladislaus Von Keviczky, 181 Claremont avenue, Joseph C. Kadane, Broadway, and Henry Waldman, 778 Prospect avenue, all of New York City. To manufacture aerial craft of every kind.

Baltimore Rubber Tire Manufacturing Co., February 18 (Maryland), \$200,000. William Albert S. Mauk, Orangeville, Baltimore County, George W. Habberset and Harry W. Reeve—both of Baltimore City,—both in Maryland. Office, Baltimore City, Maryland. To manufacture automobile tires.

Banner Tire & Supply Co., The, February 8 (Ohio), \$250,000. T. J. Mills, F. L. Woodbridge, Charles A. Wobbe, S. W. Kirts and J. O. Crawshaw.

Bartlett-Yates Insulation Co., Inc., The, March 17 (New York), \$10,000. Henry N. and Bertha L. Bartlett, both of 312 Park street, Westfield, New Jersey, and John S. Yates, 381 West End avenue, New York City. Electrical supplies, insulating materials, etc.

Bentley-Eves Rubber Co., February 25 (Illinois), \$15,000. W. A. Bentley, Roy Physioc and Henry L. Blum. Office, 142 West 27th street, Chicago, Ill. To manufacture and deal in tires, casings, tubes, automobile accessories, etc.

Burke, Inc., Walter V., March 21 (New York), \$1,000. Walter V. Burke, 241 West 54th street, Thomas F. MacMahon and Bailey C. Elliott, both of 1400 Broadway, both in New York City. To manufacture auto tires, etc.

Fellsen Tire Co., Inc., The, March 21 (New York), \$10,000. William N. and Carmen V. Callahan, both of 171 West 71st street, and John McEwan, 61 East 76th street, both in New York City. Auto tires, etc.

Firestone Tire & Rubber Co., March 4 (Maine), \$50,000. George S. Soule (president), South Portland, J. P. O'Donnell (treasurer), and James E. Manter (clerk), both of Portland, both in Maine. Office, Portland, Maine. To manufacture and deal in tires, rubber hoof pads, etc.

Luck Tire & Manufacturing Co., The, March 1 (Delaware), \$500,000. D. A. and C. M. Walker, both of San Antonio, Texas, and C. J. Davis, East Palestine, Ohio. Office, 311 South State street, Dover, Delaware. To manufacture and deal in tires, tubes and automobile accessories.

Mason Motor Car Co., Inc., March 7 (New York), \$30,000. Norris N. Mason, Waldo avenue, Arthur W. Logan, Bayside avenue, both in Bayside, Queens, New York; and Julia Ward, 16 East 48th street, New York City. Office, 1746 Broadway, New York City. Motor cars, tires, etc.

Millbury Rubber Goods Co., Inc., March 21 (New York), \$50,000. Edward E. Reardon, 246 East 49th street, Edward J. Rathers, West 204th street and Harlem River, both in New York City, and Irving V. W. Williams, 661 Madison street, Brooklyn, New York. To manufacture tires, etc.

Modern Tire & Repair Co., February 5 (Texas), \$25,000. F. M. Van Brunt, T. E. Armitage and E. E. Patterson, all of Houston, Texas. Office, Houston, Texas. To deal in tires, tubes and automobile accessories.

Mohawk Valley Supply Co., Inc., March 1 (New York), \$100,000. Charles O. and Josephine B. Terwilliger, and Ethel H. Plumb, all of Herkimer, New York. Auto tires and accessories.

Moore Braiding Co., Inc., March 6 (New York), \$3,000. John V. and George C. Moore, both of Westerly, Long Island, and Edward Weintraub, 151 Second avenue, New York City. To manufacture elastic cords, etc.

Motor Accessory & Tire Co., The, January 13 (Colorado),

\$50,000, divided into 50,000 shares of one dollar each. A. V. Fagerstrom, R. J. Weaver and W. T. Mathis, all of Pueblo, Colorado. To deal in tires, tubes, sundries, etc.

Motor Tire & Accessories Co., March 6 (Delaware), \$75,000. W. H. and A. H. Sponsler, and W. A. Sponsler Jr., all of New Bloomfield, Pennsylvania. Office, Equitable Building, Wilmington, Delaware. To manufacture automobiles and supplies for same.

National Rubber & Specialties Co., The, March 2 (Ohio), \$25,000. J. E. Bancroft, G. M. Allen, Gustave W. Drach, C. L. Bonifield and H. L. Gordon. To manufacture vulcanizers and specialties.

Overland Tire & Rubber Co., Ltd., February 22 (Canada), \$50,000, divided into five hundred shares of one hundred dollars each. John Joseph O'Reilly, Neil Francis MacNeil, William Raymond MacKay, Julius Day-Luce and William Henry Wickham. Office, Montreal, Quebec. To manufacture and deal in rubber, tires, tire fabrics, etc.

Paige & Co., Inc., H. Ray, March 24 (New York), \$100,000. Albert T. Maurice, Rye, New York, Paul B. Barringer Jr., 4 West 53rd street, and Samuel Kaltman, 532 West 152nd street—both in New York City. To manufacture auto tires, rubber goods, etc.

Perlman Rim Corporation, March 15 (New York), \$500,000. Jerome A. Lederman, Edward H. Kelly and Ralph G. Coad, all of 43 Cedar street, New York City. Tires, rims, auto accessories, etc.

Phoenix Rubber Co., The, March 11 (Ohio), \$125,000. J. E. Whigam, J. R. Brown, F. Hopper, S. H. Rosh and A. J. Noble.

Ravenna Rubber Co., The, February 2 (Ohio), \$100,000. L. E. Yaggi, H. Hill, W. Ragcliff and H. M. Boyle. To manufacture clothing, etc.

Safety First Auto Parts Co., Inc., March 21 (New York), \$25,000. Paul U. Daniel, George H. Hutchings and Fred S. Jackson—all of 417 Law Exchange Building, Buffalo, New York. Auto parts of all kinds.

Southwestern Tire Manufacturing Co., March 2 (Oklahoma), \$250,000. W. A. McClelland, J. T. Wheatley, John L. McClelland, Charles W. Gunter, C. Charles Jones and W. F. Westcott—all of Oklahoma City, Oklahoma. To manufacture tires and tubes, etc.

Sturdy Tire & Rubber Co., Inc., March 16 (New York), \$1,000. Benjamin J. Laxer, 1537 43rd street; Frank P. Hayes, 373 Tompkins avenue—both in Brooklyn, New York, and Michael Laxer, 338 East 88th street, New York City. To manufacture auto supplies, tires, etc.

Tireoid Co., The, March 14 (Maine), \$1,500,000. T. L. Croteau (president), A. B. Farnham (treasurer) and Albert F. Jones (clerk)—all of Portland, Maine. Office, Portland, Maine. To manufacture and deal in Tireoid and other compounds and compositions for rendering rubber tires puncture proof, etc.

Upright Tire & Rubber Co., Inc., March 1 (New York), \$1,000. Sydney Bernheim, 305 West 72nd street, New York City; Catherine Weldon, 591 7th street, and Harry H. Jacobson, 555 Grand street—both in Brooklyn, New York. To manufacture tires and rubber goods.

Walters Rubber Co. of New York, Inc., March 7 (New York), \$5,000. Howard S. Walters, 182 Miller avenue, Freeport; John H. Jube, 928 East 18th street, Brooklyn—both in New York, and Albert R. Jube, 638 Mount Prospect avenue, Newark, New Jersey. Auto tires, etc.

Unedea Tire Co., March 13 (New Jersey), \$10,000. Nathan Rosenberg, Max Roth—both of 22 Prospect Place, and A. Milton Jacobs, 532 Market street—both in Newark, New Jersey. Office, 9-15 Clinton street, Newark, New Jersey. To manufacture and deal in automobiles, etc.

CLASSIFICATION OF UNCOVERED TENNIS BALLS.

A recent decision of the Board of General Appraisers regarding shipments of uncovered tennis balls by George Borgfeldt & Co., New York City, overruled the collectors' action at New York and Philadelphia in classifying them as "toys," as they were largely used for playing tennis on wet courts and not exclusively for the amusement of children. This decision is of interest to dealers, since under the appraisers' classification as "manufactures of rubber not specially provided for" the duty is reduced from 35 to 10 per cent.

TEXTILE COMMITTEE OF AMERICAN SOCIETY FOR TESTING MATERIALS MEETS.

Committee D-13 of the American Society for Testing Materials held an interesting meeting on Friday and Saturday, March 17 and 18, at the United States Rubber Co.'s building, 1790 Broadway, New York City.

William D. Hartshorne, chairman of the committee, called the meeting to order, and after the routine business had been disposed of, recommendations for standard tests of hose, belting and similar fabrics were discussed.

While substantial progress was made towards unifying the theory and practice of testing the fabrics under consideration, nothing definite was determined. The whole matter will be further considered at the meeting to be held at Atlantic City, New Jersey, next July.

CANADIAN RECLAIMING PLANT BURNED.

The reclaiming works of the Rubber Regenerating Co. of Canada, Limited, Montreal, were almost entirely destroyed by a fire on the 19th of last month from a cause which has not yet been determined. It is stated that there was no inflammable material on the floor where the fire started, nor anything to cause so rapid a progress of the flames as was experienced. Its start was traced at or near the outside window, and there are some suspicions of incendiarism. The building was a four-story one, the floors being of pine wood, which, with the contents, burned rapidly, leaving the walls almost intact, but the inside practically destroyed. This was a comparatively new department, which was so successful that an extension was contemplated. It is estimated the loss was between \$40,000 and \$50,000. The company has on hand sufficient stock so that no delay is likely to be caused by this conflagration. The shoe factory of the Canadian Consolidated Rubber Co., Limited, was separated only by a heavy party wall, which prevented further spread of the flames. Otherwise the entire block would probably have been destroyed.

A SPECIAL RUBBER NUMBER.

We congratulate our good friend, James Acton, publisher, *The Shoe & Leather Journal*, Montreal, Canada, upon his "Rubber Special," which appeared in March 1. In addition to the regular interesting matter of leather footwear, the department devoted to rubber boot and shoe matters is very complete. It covers the new Canadian list with comments upon them, a review of the Dominion stocks and the prospects for the season. Incidentally, the new rubber price lists are given, in detail, for every type made in Canada, and the rubber news is very comprehensively covered. It will be remembered that early in the spring there is often a banquet of the shoe men in Toronto—this year was no exception. In the chronicle of it contained in the "Rubber Special" many old friends among the rubber manufacturers were noted as being present. Among the speakers was R. H. Greene, of Gutta Percha & Rubber, Limited, who reviewed the development of the rubber industry very interestingly.

The cover of the "Special" was graced by a fine portrait of W. H. Miner, of the Miner Rubber Co., Granby, Quebec.

THE ADOPTED LIST OF DRUGGISTS' SUNDRIES.

A TENTATIVE list of soft rubber, druggists' sundries, suggested by the Drug Sundries Division of The Rubber Club of America, Inc., was published in *THE INDIA RUBBER WORLD*, August 1, 1915. With but two exceptions this list has been approved by the United States Customs Service. The revised list is as follows:

SOFT RUBBER DRUGGISTS' SUNDRIES.

| | |
|-------------------------------------|---------------------------------------|
| Air Beds. | Empyema Tubes. |
| Air Pillows and Mattresses. | Ether Bags. |
| Applicators. | Face Masks. |
| Aprons (Surgeons', Sanitary). | Finger Cots. |
| Atomizer Bulb Sets. | Fittings for Nursing Bottles. |
| Baby Pacifiers. | Funnels (Soft Rubber). |
| Bags (Breeder, Gonorrhea, Ear, | Gloves (Autopsy, Household, Ob- |
| Throat, Mastoid, Intra-gastric, | stretical, Surgeons', Veterinary, |
| Face, Gas, Sterile Dressing, Ice, | etc.). |
| Pulitzer, Sponge, Blood-Pressure, | Gum (Bandages). |
| etc.). | Hospital Blankets. |
| Bandages. | Ice Helmets. |
| Basins. | Invalid Cushions. |
| Bath Sprays. | Medicine Droppers (unless glass |
| Bed Pans. | chief value). |
| Belts (Umbilical, Abdominal, Gum, | Nasal Feeding Tubes. |
| Perforated Frictional Belts, etc.). | Nipple Shields. |
| Bibs. | Nipples. |
| Bougies. | Obstetrical and Operating Cushions. |
| Breast Pumps. | Obstetrical Sleeves. |
| Breast Shields. | Operating Caps and Pads. |
| Bulbs (Atomizer, Syringe, Complex- | Pessaries. |
| ion, Dental, Breast Pump, etc.). | Rubber Corks and Chemist Stoppers. |
| Caps (Operating Head Caps, Test | Sheeting. |
| Tube Caps, Ice Caps, etc.). | Spinal Ice Bags. |
| Catheters. | Sponges (Rubber). |
| Coils (Head, Abdominal). | Sprinklers (Disinfecting). |
| Complexion Cups. | Stethoscope Tubes. |
| Covers (Drainage, Gauze, Dilator, | Stopples. |
| Segregator, Sanitary). | Syringes (Bulb and Bag). |
| Crutch Tips. | Teething Rings. |
| Cupping Cups. | Tourniquets. |
| Cushions (Obstetrical, Operating, | Tubes (Rectal, Colon, Stomach, etc.). |
| Chair, Hospital, Embalming, etc.). | Tubing (Rubber). |
| Dam (Dental). | Urinals. |
| Diapers. | Water Bottles. |
| Dilators. | |

RUBBER CLUB STANDING COMMITTEES RECENTLY APPOINTED.

EXECUTIVE COMMITTEE.

Harvey S. Firestone, chairman, Firestone Tire & Rubber Co., Akron, Ohio.

George B. Hodgman, Hodgman Rubber Co., Tuckahoe, New York.

Van H. Cartmell, Kelly-Springfield Tire Co., 227 West 57th street, New York.

H. Stuart Hotchkiss, United States Rubber Co., 1790 Broadway, New York.

William E. Bruyn, L. Littlejohn & Co., 138 Front street, New York.

Paul W. Litchfield, Goodyear Tire & Rubber Co., Akron, Ohio.

LEGISLATIVE COMMITTEE.

Frederick C. Hood, chairman, Hood Rubber Co., East Watertown, Massachusetts.

H. Stuart Hotchkiss, United States Rubber Co., 1790 Broadway, New York.

Jesse E. La Dow, Mansfield Tire and Rubber Co., Mansfield, Ohio.

AUDITING COMMITTEE.

Edward E. Huber, chairman, Eberhard Faber, 37 Greenpoint avenue, Brooklyn, New York.

William G. Grieb, Ajax Rubber Co., Inc., 1796 Broadway, New York.

TIRE SHIPMENTS TO NEUTRAL EUROPEAN COUNTRIES FACILITATED.

The issuance of London permits for the shipment of tires to neutral European countries by the way of England has been greatly facilitated by the adoption of a plan formulated by the advisory committee of the Rubber Club. The British authorities will now recognize shipments certified by the Rubber Club and issue permits promptly. Thus tires can be shipped from England, arriving at their destination before or at the same time as the automobile or motorcycle for which they are intended.

TRADE NOTES.

The Standard Tire & Rubber Co., manufacturers of tires, mill supplies and mechanicals, with offices in the Hippodrome Building, Cleveland, Ohio, and factory at Willoughby, Ohio, has appointed R. F. Valentine, for 12 years sales manager for the Mechanical Rubber Co., Cleveland, Ohio, as director of sales. The newly elected board of directors is as follows: Mark J. Gillen, Christian Narten, D. O. Summers, Robert S. Winsley, E. L. Thompson, John F. Schulte, Charles F. Groth, Charles B. Shaw and R. F. Birch.

The Williams Tire & Rubber Co., McKeesport, Pennsylvania, whose new plant at Lavista, Pennsylvania, is about one-half completed, expects to begin manufacturing by July 1.

The Goodyear Tire & Rubber Co., Akron, Ohio, has enlarged the storage facilities of its branch at Philadelphia, Pennsylvania, by the addition of a new warehouse at 24th and Locust streets, which has a capacity of 25,000 tires. The Philadelphia branch is under the management of Woodson Reese.

The Brooklyn, New York, branch of the Firestone Tire & Rubber Co., Akron, Ohio, whose prospective removal was mentioned in the January issue of THE INDIA RUBBER WORLD, is now occupying its new quarters at the corner of Bedford avenue and Sterling place. The building is of brick, two stories high, and contains 8,000 feet of floor space. E. L. Bixby is manager.

The Empire Rubber & Tire Co., Trenton, New Jersey, is now producing red tires exclusively. Four years ago the company made its first red case and for the past two years the Empire red tire has been featured so successfully that it has now been decided to concentrate on this well-known type.

At the annual meeting of the Kelly-Springfield Tire Co., New York City, held on March 14, at the office of the company at Jersey City, New Jersey, the directors were reelected as follows: Stephen Peabody, Jacob Oppenheim, Arnold L. Scheuer, Gustavus Maas, Austin M. Poole, Otis R. Cook, Frederick A. Seaman, and Van H. Cartmell. Mr. Cartmell is president and Mr. Seaman secretary.

The Luck Tire & Manufacturing Co., which once proposed to build a factory in San Antonio, Texas, has located at Jonesville, Michigan. Special machinery is being installed and the company expects shortly to begin the manufacture of a new tire.

The Federal Rubber Manufacturing Co., Milwaukee, Wisconsin, has discontinued its Denver, Colorado, branch, arranging with the Federal Rubber Tire Works Co. of Denver to act as its distributor for Colorado and adjacent territory. E. R. Cumbe is president of the new distributing concern.

The Marathon Tire & Rubber Co. of New York, Inc., has taken over the business of the Akron-Marathon Rubber Co., Omaha, Nebraska, formerly owned and operated by H. H. Replogle, who remains as manager in charge of this branch, which will handle the business of the company in the Middle West.

The McGraw Tire & Rubber Co., East Palestine, Ohio, has increased its capital stock from \$1,400,000 to \$3,000,000.

The National Tire Service Association, recently organized at Indianapolis, Indiana, will hold its second meeting at Louisville, Kentucky, April 15. The association is composed of tire distributors who endeavor to provide road service for tourists and it is planned to establish tire service stations throughout the United States. The officers of the association are as follows: Roy E. Warner, Louisville, Kentucky, president; Frederick C. D. Dobson, secretary; B. O. Leftwich, treasurer—both of St. Louis, Missouri. Membership committee: Clem T. Strauss, Indianapolis, E. J. Goetze, Kansas City, Missouri, and L. P. Hallaran, Cleveland, Ohio.

The Mason Tire & Rubber Co., Cleveland, Ohio, has increased its capital stock from \$250,000 to \$1,000,000.

The Baltimore Rubber Tire Manufacturing Co. has been organized, and expects to be ready to manufacture tires and inner tubes about July 1. The company has secured a plant at Orangeville, Maryland, which was formerly occupied by the Maryland Mantel & Manufacturing Co. The capital stock of the Baltimore company is placed at \$200,000, all common. George W. Habbersett is president, Harry M. Rever secretary-treasurer, and Albert S. Mauk vice-president and general manager. Mr. Mauk, who will be superintendent of the factory, is a rubber expert, and holds several patents for improvements in tires, which will be exploited by this new corporation.

The Niblette Rubber Co. has secured location at 1777 Broadway, New York City, and will distribute through dealers the "Stronghold" tires and tubes manufactured by the Rubber Products Co., Barberton, Ohio, handling in addition thereto a line of mechanical rubber goods over a large section of eastern territory. H. B. Niblette, the proprietor of this company, was for 17 years associated with The B. F. Goodrich Co., Akron, Ohio, and for the last six years managed the Buffalo branch of that concern, previous to which time he was a salesman connected with the New York branch. He has a large acquaintance in the territory which he will cover in this new connection.

JOHN B. MAUS JOINS FISK RUBBER CO.

John B. Maus, formerly Eastern district manager of the Batavia Rubber Co., Batavia, New York, has joined the Fisk Rubber Co., of New York City, and will have charge of the export department at the general office in Chicopee Falls, Massachusetts. Mr. Maus began his career in the tire industry ten years ago, as special factory representative of the Goodyear Tire & Rubber Co., Akron, Ohio, later coming to New York as district manager for that company. Four years ago he became connected with the United States Tire Co. and remained with that company until he joined the Batavia force in 1914.

FISK RUBBER CO. OPENS NEW WELFARE DEPARTMENT.

Dr. William Hall Coon, whose affiliation with the Fisk Rubber Co., Chicopee Falls, Massachusetts, was mentioned in the December issue of THE INDIA RUBBER WORLD, has recently announced the completion of a plan to center all activities which concern the relation of the Fisk company with its employees under a department of Industrial Relations. The work of this department will be arranged in three main divisions, under the following heads: Division of Safety and Hygiene, Division of Medicine, and Division of Labor.

The Division of Safety and Hygiene will strive to reduce the number of accidents occurring within the plant; to educate the employe in habits of safety and caution, and will take those measures necessary to secure in all parts of the factory the best of working conditions.

The Medical Division will, through a well-equipped hospital and corps of physicians and nurses, care for all those who may become injured or ill during working hours. Visiting nurses will give assistance in the homes to those who may require or wish their services.

The Division of Labor will concern itself with the relations of the company to the individual employe, and through this division an attempt will be made to bring about conditions of labor within the factory which will react with equal benefit to the employe, to the company and to the community.

In the furtherance of this plan, and without any cost to the employe, the company has provided for the compensation of all those in its employ who may become ill for any reason or who may be disabled through accidents foreign to their occupation.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

Progress in the Tire Trade.

THREE NEW INITIALED TREADS.

WHILE it seems almost impossible that any new designs in anti-skids could be produced, three of the big tire companies are out with absolutely new ones. These might be described briefly as initialed tire treads. The Revere Rubber Co., Chelsea, Massachusetts, for example, runs a double row of



R's around the circumference. The Hartford Rubber Works Co., Hartford, Connecticut, does the same with the letter H; while the G. & J. Tire Co., Indianapolis, Indiana, uses the initials of its corporate name in the same way. The effect is very artistic, and, aside from that, there is no doubt that they will provide protection against slipping just as well as any other pattern.

A NEW GUARANTEED TIRE.

The new "Ebony Tread" tire has a ribbed tread of tough black rubber, which commends itself to those who desire some marked individuality and distinction in their outfits.

This tread is the result of exhaustive experimentation, and such thorough and severe tests have been applied to the finished product that the manufacturer places confidence in its endurance to the extent of attaching to every tire a warranty tag, guaranteeing the tread good for 5,000 miles. [The Pennsylvania Rubber Co., Jeannette, Pennsylvania.]



BOWERS BUILDS TIRES.

The Bowers Rubber Works, San Francisco, California, long a manufacturer of mechanical rubber goods, has entered the tire field, bringing out a hand-built tire with a new and effective non-skid tread design. The Bowers company makes a point of the fact that this tire is the result of study and experiment that has gone on for a long time, and feels that it has produced a winner, both in appearance and service.



Headquarters of the Standards Committee of the Society of Automobile Engineers are now in New York City at the offices of the Society in the Engineering Societies Building, instead of in Detroit, Michigan, where a separate office has been maintained for the past year. A. C. Woodbury, recorder of the committee, who has active charge of the routine, has removed his home from Detroit to New York.

THE DOUBLE SEAL TIRE VALVE.

Every one knows that pneumatic tires must be air tight in order to be serviceable. And almost every one knows that a tire cannot be air tight when it is afflicted with a leaky valve.

It is claimed that the double seal tire valve will not leak, which is largely due, no doubt, to the use of rubber washers and packing where leaks are liable to occur.

The valve cap, for instance, which is shown above on the right, is provided with a rubber washer. The valve inside, shown under the cap, has a rubber washer just below the head, where it is seated on the end of the valve stem. Also there is a small sleeve packing of rubber near the lower end of the valve that snugly fits the bore of the valve stem. Thus it will be seen by referring to the illustration on the left how

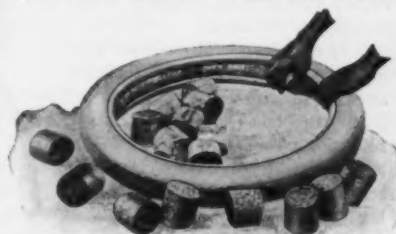


effectively the valve is sealed.

These valves are interchangeable with all standard stems. They can be removed and seated without tools, simply by the fingers. They operate so smoothly that the disagreeable labor of pumping up the tire is greatly reduced. [Double Seal Tire Valve Co., New York City.]

A RUBBER TIRE FILLER.

Unlike the various preparations that are pumped into the tire for the purpose of avoiding punctures, this filler is made of rubber. Small pieces are cut up, treated by a special process, and molded into cylindrical annular forms, which are subsequently vulcanized. These forms are made to fit all the different casings, thereby eliminating the inner tubes. The filler is placed in the casing in sections, after which it is pressed on the wheel-rim by special tools provided for that purpose. Several advantages are thereby claimed—saving inner tube expense, prolonging the life of the casing, and immunity from puncture troubles. [National Rubber Filler Co., Midlothian, Texas.]



IMPROVED TIRE-TESTING TANK.

The tire-testing tank in garages is usually a wooden tub, or barrel sawed in two, partly filled with water, which is generally quite dirty—a condition due to the fact that the water is rarely renewed, as the tub has no drainage connection. A new tire-testing tank made of glazed porcelain has been placed on the market. The white porcelain background reflects the bubbles as they rise from the leak in the inflated tube, and the glazed surface facilitates keeping the tank clean. It stands on a porcelain pedestal, which brings it about 30 inches from the ground, relieving the repair man from the necessity of stooping over while testing a tube. The tank is provided with an outlet that can be connected with sewer or drain. [The Trenton Potteries Co., Trenton, New Jersey.]

CHANGES IN THE FIRESTONE ORGANIZATION.

F. W. Suhr, special factory representative of the Firestone Tire & Rubber Co., Akron, Ohio, for a number of years, has been made manager of the New York tire department.

A. L. Manley, formerly manager of the Buffalo, New York, branch, now manages the Newark, New Jersey, branch, and has charge of the export business of the company handled in Newark.

H. W. McFadden has been transferred from Dallas, Texas, to succeed Mr. Manley as manager of the Buffalo branch.

H. A. Grubb, formerly manager of the Cleveland, Ohio, branch, has been appointed Texas manager, with headquarters at Dallas.

F. M. Moore, who was connected with the office at Chicago, Illinois, has been promoted to managership of the St. Louis, Missouri, branch.

C. W. Sullivan will act as traveling representative, with headquarters at Syracuse, New York.

G. A. Richards, formerly manager of the Columbus, Ohio, branch of the Firestone Tire & Rubber Co., Akron, Ohio, has been made manager of the company's branch at Pittsburgh, Pennsylvania.

G. E. Ranney, formerly of the Chicago, Illinois branch, has been appointed manager in Mr. Richards' place at Columbus.

E. R. Wood, formerly connected with the Los Angeles, California, branch, has been promoted to managership of the branch at Seattle, Washington.

PREST-O-TORCH FOR BRAZING SOLID TIRE WIRES.

It is claimed that the Prest-O-Torch, shown in the illustration, will be the natural successor to the gasoline blow torch and its multifarious uses. This little device consists of a metal nozzle and bent tube, connected by rubber tubing to an ordinary Prest-O-Lite gas cylinder.

It is easy to operate; simply turn on the gas, light it with a match, and an intense flame is produced that can be used for brazing, soldering connections and lead burning in storage batteries. Recently blacksmiths, carriage-makers, buggy repair men and wheel manufacturers have become interested in the use of this torch for brazing the retaining wires of solid tires. For this work a prepared spelter consisting of a brass flux, and brass in granular form is used as a filling material. [The Prest-O-Lite Co., Inc., Indianapolis, Indiana.]



THE DOBBING REPAIR PATCH.

A new tire repair device consists of four cross chains attached at each end to a metal plate, and an inner patch. When a puncture occurs and the tire is deflated, the patch is placed over the hole, on the inside of the shoe, with the sticky side next the casing. The chains are then placed over the tire, by means of hooks fastened to the rim, between it and the tire bead, the plates to which the chains are attached being slipped over the ends of these hooks. When the tire is inflated the chains hold the edges of the puncture firmly together. This device is made for both straight side and clincher tires, and a curve in the slots in which the chains are inserted in the plates provides for a variety of adjustments. [The Weed Chain Tire Grip Co., Bridgeport, Connecticut.]

CONTINENTAL RUBBER CO. TO BUILD.

The Continental Rubber Co., Sandusky, Ohio, whose incorporation was noted in the March issue of THE INDIA RUBBER WORLD, expects to let the contract for the construction of its factory by May 1. The present offices of the company are in the Laurence building, Sandusky. Directors not mentioned in the incorporation notice are: C. B. DeWitt and W. F. Seitz. J. J. Dauch, president of the company, is an influential man at the head of several other important industries; J. T. Sloat, treasurer, is prominently identified with drydock and shipbuilding interests. Sidney Frohman is vice-president. C. E. Sprague, secretary, and L. J. Weadock, field manager, are under contract to act as sales managers when operations are begun.

PORTER RUBBER CO. BUILDS NEW PLANT.

The Porter Rubber Co., Salem, Ohio, whose incorporation was noted in the November, 1915, issue of THE INDIA RUBBER WORLD, is erecting a new plant which will have a capacity of 400 tires and 400 tubes per day. The factory has about 30,000 feet of floor space and is equipped with a system of traveling cranes for handling material and machinery. The steam plant consists of four 250 horse-power Caldwell water-tube boilers, with Jones under-feed stokers. The power plant consists of an 800 horse-power Harris engine for mill line drive, Erie City variable speed engines for calender drive, and motor drive for the lighter machines. The Banner Machine Co.'s tire building machines with individual motor drive will be used exclusively. Manufacturing will begin by April 1. The officers of the company are as follows: J. C. Porter, president; A. H. Boyd, vice-president; E. E. Boyd treasurer; Grant Hill, secretary and general manager. C. F. Pickton is engineer.

FIRESTONE MANUFACTURES BICYCLE TIRES.

The Firestone Tire & Rubber Co., Akron, Ohio, has recently begun the manufacture of bicycle tires. After months of careful experimenting and testing, two grades of single tube bicycle tires have been brought out by the company, in 28 x 1½-inch size only.

One is a blue tread, white side-wall tire, built with two plies of 9-ounce motorcycle fabric, with an extra strip inserted under the tread. The fabric is frictioned on both sides and skim-coated with pure gum, which it is claimed gives combined lightness, resiliency and strength. The tread is of the well-known Firestone Non-Skid design, and a heavy flannel rim strip prevents creeping on the rim.

The other bicycle tire has a black tread and red side-wall and is made for heavy service, being noticeably oversize. It has two plies of 14-ounce fabric, heavily frictioned on both sides and with an extra skim coat. The tread is of the same Non-Skid design but larger and heavier, and the inner layer of pure extra thick rubber.

MISTAKEN FOR AN OFFICER.

At the recent convention of salesmen of the United States Rubber Co., handsome gold and enamel buttons were distributed bearing the trade mark recently adopted by the company, the letters "U. S." being most conspicuous. This led to a funny mistake recently when a salesman riding on a train and wearing this button conspicuously on the lapel of his coat was asked by the conductor where he expected to find his next victim. Rather resenting a question which seemed to imply a rather uncomplimentary relation between the salesman and his customers, an explanation was demanded, which caused the conductor to more closely examine the button, which resulted in an exclamation: "Aw, shucks! I thought you were a United States post office inspector."

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

ALL branches of the rubber trade in this section report a most prosperous business. In fact, there has hardly been a time since the writer has represented the INDIA RUBBER WORLD in this section that the story has been so universally one of prosperity. The belting manufacturers are benefiting by the scarcity and consequent high cost of leather. Factories which hitherto have used leather belting almost exclusively, are now buying rubber belting as a matter not only of economy but of necessity. This is a season when contracts are usually made for fire department hose, and there is evidence that there is more business in prospect this spring than on any previous one. In the tire business, manufacturers report orders ahead and some of them are increasing their capacity. The footwear trade has been especially favored. Not for years has New England been so thoroughly covered with snow for so long a period, and the consequence has been that trade here in rubber footwear has fully doubled that of any normal season, and every rubber footwear company has been entirely cleaned out of stock goods and has more orders ahead than at any time in its history. The clothing trade has been especially active, and factories making clothing are running along to full capacity. Drug sundries' manufacturers are having their share of the prosperity and, taken altogether, the trade could hardly be in a better condition.

The chief feature of the past month has been the Automobile Show, which this year was a great success, not only as an exhibition, but also as a business bringing project. A record number of machines were sold. The general prosperity of the country seems to be reflected in the demand for new machines, both from veteran motorists and from those who this year are buying their first car. Some considerable trouble was encountered by exhibitors on account of the freight embargo, but, taken as a whole, the exhibition of cars, both for pleasure and business purposes, was far ahead of any previous one. The halls were handsomely decorated, perhaps in a more picturesque manner than at any previous exhibition of any kind given in this great building. The central feature, which would at once attract members of the rubber trade, was a gigantic tire placed in the center of the grand hall, this tire being at the intersection of the center aisles and supported by four mammoth figures, representing *Invention, Progress, Industry and Success*. Manager Campbell may well be proud of the result of his labors.

Not many tire manufacturers had special exhibits, but the majority of the leaders were represented, their tires being shown upon the machines exhibited. Several companies manufacturing specialties in the accessory business had interesting exhibits. Not many novelties were presented, but many of the booths were very attractive, and the attendants most enterprising in the presentation of the values of their specialties. It would be an injustice to others were I to mention any particular exhibit and, therefore, it may be best to say that, taken altogether, the accessory features of the show were fully as thorough as were the automobile exhibits themselves.

Readers of THE INDIA RUBBER WORLD will recall the fact that a new philanthropy was made possible by the munificence of Thomas Alexander Forsyth and the late John Hamilton Forsyth, of the Boston Belting Co., by the erection of the Forsyth Dental Infirmary in this city. The first annual report of this important institution is at hand and briefly states the object for which the infirmary was founded and the work done during the year 1915. That it must have been and will continue to be a wonderful benefit in its field of usefulness is shown by the fact that an average of 413 patients per day were treated; that the operations amounted to over 130,000, and that these were performed on 19,930 patients. Added

to this there were a large number of clinical cases, while professional lectures to the infirmary staff and free public lectures were given, all on dental subjects. The lectures for the public are held every Sunday. No one can read this concise report without realizing that Mr. Forsyth has set an example of public benevolence which might well be followed by philanthropists in other cities, large and small, in this country.

The United States Rubber Co.'s new premises at 130 Essex street are approaching completion, and undoubtedly the offices will be moved to the new location early this month. This removal, which is simply across the street, will be no inconvenience to the many customers who usually called at the old location, while the change to the more modernized building will be a welcome one to those occupying, and also those visiting, the offices.

The American Rubber Co. is already settled in its new quarters, and certainly the premises show a splendid adaptation to the needs of that business.

Ellsworth H. Hicks, assistant manager of the clothing department of this company, has recently returned from a very successful trip over a large portion of the United States. Mr.



ELLSWORTH H. HICKS.

Hicks is well known from one end of the country to the other and is one of the leading salesmen in this trade. He has been interested in the waterproof clothing trade his whole business life. Even as a mere lad, so to speak, in 1883, he began his business career with the American Rubber Co., later traveling for the company as far west as the Missouri River, also taking in Canada and the South. He was with that company for 12 years and then went to the Boston Gossamer Rubber Co., representing that concern on the road for four years. For the last 15 years he has been with the Stoughton Rubber Co., occupying most of that time the position of vice-president and assistant manager. Upon the recent consolidation of the Stoughton and American companies he was made assistant manager of the clothing department. Mr. Hicks is a thorough, wide-awake business man who has friends in the trade wherever he has traveled, and that has been far and wide over the United States and Canada, with an occasional trip across the water, and I am pleased to be able to show his face in this connection, knowing that it will be welcome to all those who know him.

C. J. Bailey, the proprietor of the oldest rubber store in this city, tells me that his is the only surviving one of 24 similar stores which were in existence when he began business or have started since. Mr. Bailey is one of the youngest old men in the business and shows his enterprise by inventing and exploiting some new device in rubber with surprising regularity. H. E. Bailey, his son, is an able assistant in the business and attends to the publicity department, while C. J. Bailey II, now a lusty youngster of four months, is already destined to succeed his grandfather and father as the leading rubber goods retailer in New England.

The Plymouth Rubber Co. is reported to have increased its sales for January, 1916, 73 per cent over those of January of the previous year, and this increase is the more noteworthy since the business in January, 1915, increased 35 per cent over that of the corresponding month in 1914.

Arthur W. Stedman, the well-known crude rubber man, has just announced to the trade his removal to a new office at 727 Atlantic avenue. This is in the handsome new building at the corner of Beach street, opposite the South Terminal station and within a block of the Hotel Essex, thus being most convenient and accessible to his many patrons and friends in the trade.

A large delegation from the Firestone Tire & Rubber factory was in attendance at the Automobile Show early last month. Among them were: D. S. Swander, district manager; E. S. Babcox, advertising manager; C. H. Sorrick, manager of pneumatic sales, and C. H. Gerhold, manager of accessory sales.

W. H. Piggott has become manager of the local branch of the Federal Rubber Manufacturing Co., at 173 Massachusetts avenue, succeeding Charles Langmaid, resigned. Mr. Piggott is a Milwaukeean, who has been in the Federal factory service for some time.

A new mill is to be erected at Newburyport by the American Tire Fabric Co., which is successor to the American Textilose Co. The mill is to be of brick, 186 feet in length, the width varying from 20 to 64 feet. The orders for machinery have already been placed, and it is expected that the mill will be completed within two months.

In my December letter I mentioned the fact that the Bemis Rubber Co.'s plant in Watertown had been sold. I understand that this plant will be equipped to manufacture coffee and breakfast foods from bananas, and also high-grade confectionery, a new company having been formed to exploit this enterprise. Everett C. Tarr, president, and E. Carleton Greenwood, treasurer of the Pan-American Chiclé Co., are prominent in this new enterprise.

The Meade Rubber Co. is the name of a new concern, which is now building a two-story brick factory at Stoughton, which is expected to be finished and occupied early next month. James Meade, the head of this company, was until recently superintendent of the Plymouth Rubber Co. During his years in the rubber business he has invented several improvements in processes for rubberizing fabrics, and it is his purpose to begin the manufacture of hospital sheetings, rubber heels and soles, and some other specialties, such as Gem inner soles for the shoe trade. He has secured a large tract of land close to the New York, New Haven and Hartford railroad tracks, excellently situated for business, and sufficiently large to allow for considerable expansion. The machinery is being installed as fast as the building progresses, and manufacturing will begin almost immediately after the factory is completed. Mr. Meade is a thorough rubber man, having been for over 20 years in the business, going first with the Stoughton Rubber Co. and afterwards with the Mystic Rubber Co., which later became the Plymouth Rubber Co., and from the position of workman in the mill he rose to be superintendent and vice-president of that corporation, a position which he held up to the time when the plant of the Plymouth Rubber Co. was removed to Canton, he deciding to remain in Stoughton and establish a new industry.



JAMES MEADE.

David A. Cutler has purchased the business, factory and real estate of the Alfred Hale Rubber Co. in South Boston. The

company will continue to make diving suits, wading pants, rubber cement and molded specialties. Mr. Cutler, who is a recognized progressive, will develop this business along up-to-date lines, and is already erecting new buildings. The company as it stands affords an excellent nucleus as it has always enjoyed a steady, moderate volume of business and high credit. W. D. Lamond, for many years with the Revere Rubber Co., is the superintendent, and Kirk L. Moses, prominently identified with rubber interests, is sales manager. The directors are Edward F. Bragg, Richard C. Storey, Francis H. Swift, Parker G. Stevens and David A. Cutler.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE several rubber factories throughout Rhode Island are at present rushing their plants at the same top-speed that has characterized their activities during the greater portion of the past year, and there is the same insistent demand for additional operatives, both experienced and inexperienced hands, that has been heard for a number of months, notwithstanding that the number of operatives now on the payrolls is far in excess of any previous period in the history of the rubber industry in Rhode Island.

Never in the history of the industry in this State has there been such a continued period of capacity business, and there does not appear to be an immediate prospect of any diminution in the demands upon the resources of the factories. This extraordinary demand is noticeable from both the foreign and domestic sources, and is for goods of all kinds, including the automobile tires, shoes, boots and medical supplies that are turned out at the local plants. The insulated wire business is also very brisk with all producers here.

From all the factories, especially those making rubber shoes, reports are at hand that orders continue to come in, and that every concern has large bookings ahead. These factories are turning out thousands of pairs of rubber shoes every day, in addition to other goods that are being made here, and the result is the greatest output that the industry has ever known in this State. The long, steady spell of bad weather underfoot has greatly accelerated the demand for rubber footwear, and the supply has been very greatly depleted.

The first annual dinner of the Providence factory organization of the Revere Rubber Co. was held at the Crown Hotel on Saturday evening, March 11, and was well attended. The occasion was one of a general "get-together" nature, and called forth a hearty spirit of comradeship and good cheer, which prevailed during the entire evening among the hundred or more employees of the company, who sat down for the first time at their own banquet. Later in the evening they enjoyed a number of addresses and a vaudeville entertainment.

Harlow W. Waite acted as toastmaster at the post-prandial exercises, and introduced as speakers of the evening Dr. T. Whittelsey, director of the New York laboratories of the United States Rubber Co.; Lieutenant James B. Littlefield, Rhode Island coast artillery corps, who spoke on "Our Country's Defenses"; Albert W. Perkins, Superintendent Arthur H. Carr and Foreman W. Ross Gates, the last three being affiliated with the Providence branch. During the serving of the dinner popular selections were played by the orchestra, and many parodies on popular songs pertaining to their own particular business were sung with a zest that left no room for doubt as to their enthusiasm.

Dr. Whittelsey gave an interesting and instructive illustrated lecture on the raising and collection of rubber on the great plantations of South America and Sumatra, referring especially to the 90,000-acre plantation maintained by the United States Rubber Co. on the latter island, half of which is already

yielding raw material. The lecture was illustrated with numerous lantern slides, which showed the young trees from the time they are planted until ready to receive their first "tapping."

He showed and explained the various processes by which the latex, after it is secured from the rubber tree, is cured and made ready to be shipped to the market, and spoke of the practice followed by the United States Rubber Co. in the care of its employes and laborers on the Island of Sumatra. He also spoke at considerable length on the work in the laboratory department, which has by various experiments succeeded in getting the most out of the plantation home products.

Albert W. Perkins gave a short talk on "Employment," and was followed by Arthur H. Carr, superintendent of the plant, who discussed "Production," and W. Ross Gates, a department foreman, who talked on "Safety First" measures. During the brief business meeting which preceded the dinner the following members of the dinner committee were elected: For two years, Frank O. Miles, office manager; Luther T. Benyon, clerk in office, and Albert E. Ludlam, assistant superintendent; for one year, A. N. Smith, William Enright, foreman, and J. Congdon. The committee of arrangements for the first banquet consisted of W. R. Gates, J. T. Brogden, M. L. Coffey, A. N. Smith, H. A. Waite and A. E. Perkins.

* * *

Between forty and fifty operatives employed in the new tennis shoe department of the Millville plant of the Woonsocket Rubber Co., which is owned by the United States Rubber Co., became dissatisfied with the piece rate the company was paying in the manufacture of this line of work, and quit work on March 18. They were immediately paid off and discharged, following which the management paid off all the help in the department, which has been in operation only about a month, and the announcement was made that the manufacture of this class of work at Millville would be suspended.

On the day in question some of the help in the new department, who were mostly young men and women, went to the management and demanded five cents a pair for their work instead of 4 cents, the price that they had been receiving. They refused a compromise offer of 4½ cents a pair and a number of them left. The management claims that employes in the new department, who had previously earned about \$9 a week, had been able to earn about \$12 when the trouble came. The people discharged were mostly of Polish extraction. The principal output of the Millville plant is rubber shoes and "lumbermen's."

* * *

The National India Rubber Co. is placing a new pressure vulcanizer of the most improved modern type and size in its factory at Bristol. Other vulcanizers of a similar type were placed in the factory a few years ago, and found to be very satisfactory. The brick foundations for the new machine were completed about the middle of the past month, and the work of erecting the machine is being pushed as rapidly as possible, and it will be in operation in a short time. The output of tennis shoes and insulated wire from this plant has increased greatly since the first of the year.

* * *

As has already been mentioned, the United States Rubber Co. has resumed manufacturing at the Locoming rubber mill at Williamsport, Pennsylvania. Thomas S. Walker, for several years prominently identified with the rubber industry in Woonsocket, but more recently at Naugatuck, Connecticut, has been sent to the Williamsport plant, where he will be employed as chief pattern-maker.

* * *

Aubrey C. Bartlett has filed notice with the city clerk that he is the owner of the McNaull Tire Co., 50 Franklin street, Providence.

The Fisk Drug Co., which opened a new store at Weybosset and Union streets, Providence, the first of last month, will specialize on Davol rubber goods.

THE RUBBER TRADE IN AKRON

By Our Regular Correspondent.

WHAT was almost a local holiday for the entire city was the gathering of the salesmen at the B. F. Goodrich Co. convention on the second and third of last month. The selling forces of this company in all parts of the country, with the exception of the Pacific Coast, were brought to Akron, as much for the purpose of engendering good fellowship and loyalty to the company as for instruction. The affair was a wonderful success from beginning to end, every participant showing enthusiasm during the two days of the convention and departing with an even higher estimation of the company which they represented.

Four special trains of Pullman cars brought the visitors to this city in the early morning when they were greeted by the committee chosen for that purpose, and taken in auto-



AUTOMOBILE PROCESSION OF GOODRICH SALESMEN.

mobiles on a trip through the principal streets of the city, where many citizens had decorated their stores or residences with bunting and flags as a welcome to the visitors. Of course the Goodrich plant was quite elaborately decorated, as was also the convention hall, in each case the general scheme being green and white, with a large amount of imitation rubber leaves, while the entire route from depot to factory was marked with Goodrich sign-posts. After the parade the salesmen were taken to the Portage and Howe hotels, which had been specially ornamented for the occasion, the entrances and lobbies of each being transformed by decorations of rubber leaves covering the walls and ceilings giving them a semblance of an Amazon rubber forest. The decorations of the hotels and factory were designed by F. C. Inglehart, of the advertising department. Some of the delegations carried appropriate pennants or banners, while others wore distinguishing costumes, a peculiarly appropriate example being the Quaker hats of the salesmen from Philadelphia; and many amusing banners served to show in a humorous way the homes of several of the delegations.

The conference was held at the plant of the Goodrich company. The Thursday morning session was opened by W. O. Rutherford, whose recent appointment as sales manager of the company made him the subject of many congratulations. In his opening address he stated that this was not to be considered as simply a business convention, but rather a returning home of the members of one big family; for, as he said, in no other way could an appreciation of the good fellowship existing and the growth of the institution and the modernizing of manufacturing methods be realized.

The afternoon session was devoted to a trip through the factory, and here the salesmen were shown not only in a general way the magnitude of the works, but each group was specially shown the manufacture of the lines of goods which they sold.

On Friday short talks were given by the various department managers. "Advertising" was discussed by E. C. Tibbitts. J. C. Lawrence spoke on "Credits." Dr. W. C. Geer, head of the developing department, explained briefly how crude rubber is successfully compounded and adapted to the many commercial uses to which it is put today. His talk was fully illustrated by lantern slides.

In connection with this convention a special edition of "The Goodrich," the house organ of the company, was printed and this is one of the handsomest specimens of such trade publications which we have seen. It consists of 40 pages, with a colored cover showing a bird's-eye view of the 57 buildings comprising the Goodrich group in connection with a giant figure typifying the Goodrich institution. He is represented as studying the world, its wants and its needs—a very striking idea, well carried out. The pages, of course, have much to say regarding the company, its management and its goods, and every page is appropriately and some are profusely illustrated. The most striking of these are the two middle pages, which when unfolded occupy a space nearly a yard long and contain individual portraits of all the members of the sales organization of the company. The department directors' and branch managers' pictures are shown grouped around that of General Sales Manager Rutherford, while the rest of the space contains small but effective portraits of 620 salesmen from the different branches, these being all numbered and tabulated, thus enabling the face of any one of this big sales force to be found at once. There are quite a number of amusing cartoons, each characteristic of the person so represented, and some other features which make the magazine more than usually interesting to its many readers.

The Portage Rubber Co., at Barberton, has just completed an addition to its plant and is now erecting another, 61x100 feet and three stories high, to be used for manufacturing tires. These additions increase the output of the Portage plant by 50 per cent.

The Service department of the Firestone Tire & Rubber Co., which is under the management of L. Greenwald, held its fourth annual conference March 16 to 18. From all over the United States the men gathered together at the home plant to review the work of the past year and discuss the problems connected with tire usage. "Courtesy, Friendliness and Fair Dealing to Each Customer Spells Real Service" is the slogan of these Firestone service men, and motorists throughout the country will share in the benefit of improved methods of service and increased effort engendered by this meeting.



L. GREENWALD

The women employees who have worked for the Firestone company three years are rewarded if they leave to be married by two weeks' vacation with full pay and two weeks' additional salary.

Early last month district sales managers of the Goodyear Tire & Rubber Co. met at the home offices to review past development and plan for the future. The reports of these managers showed a remarkable growth in the sales and popularity of the Goodyear tires.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

JOHN A. LAMBERT, of the Acme Rubber Manufacturing Co., is the head of the Manufacturers' Committee named to cooperate with a committee of the Trenton Chamber of Commerce to arrange for a big industrial show in the Second Regiment Armory sometime next fall. The unusual success attending the recent automobile show held in the armory has inspired a movement to hold the industrial show.

Those who financed the automobile show went into the project with the idea that they would be satisfied if they got back their original investment. The event was so successful, however, that the executive committee declared a dividend of 50 per cent. Many of the rubber companies have already made tentative plans to take part in the proposed industrial show and there is every reason to believe that it will prove even more of a success than the automobile show.

One of the features of the automobile show was an exhibit of tires made by the Thermoid Rubber Co., and which were used by Resta, De Palma, Burman and other "speed kings" in some of the recent auto classics. In spite of the crucial tests to which they had been subjected the tires were all intact.

The Globe Rubber Tire Manufacturing Co. had an interesting exhibit of its tires and tubes at the auto show. This concern's display occupied two booths and thousands of people were attracted by it.

The Essex Rubber Co. exhibited at the show and featured some of the newer products it has added to its already extensive line.

Workmen from the various tire manufacturing factories in Trenton have formed an organization. One of the objects of the organization, the men say, is to promote cooperation between the employees and the heads of plants.

Trenton rubber manufacturers are in some instances considerably embarrassed by the long-continued strike of the workmen in the local foundries. It has been difficult for some time to obtain molds. Five foundries are affected by the strike.

John A. Lambert, of the Acme Rubber Manufacturing Co., as chairman of the Manufacturers' Committee of the Chamber of Commerce, has taken up with the Inter-State Commerce Commission the question of the embargo on freight transportation, as it at present exists along the Atlantic coast, from Baltimore to Boston. The railroads are handling practically no shipments from factories between New York and Philadelphia and the situation is becoming intolerable. It is thought the Inter State Commerce Commission may be able to obtain some relief for the manufacturers.

The Philadelphia and Reading company lifted the embargo in Trenton for a time this week and as soon as this news was noised about the local station was swamped with shipments.

WESTERN NOTES

Katzenbach & Bullock Co., of New York, Trenton and Chicago, announce the opening of an office in San Francisco, California, in conjunction with the L. H. Butcher Co., to care for largely increased business in the West.

W. D. Albright has been appointed manager of the Seattle, Washington, branch of The B. F. Goodrich Rubber Co., Akron, Ohio, with supervision of the firm's interests in Portland, Spokane and Vancouver, B. C. He succeeds W. S. Bloomer, who has been advanced to the position of special mining representative for the Goodrich company.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

NEXT to the war, with its various fortunes, the main topic of late has been the weather. The heavy rainfall of the earlier part of February was followed in the last week of the month and the first week of March by a series of snowstorms of unusual severity. There has been a great run on goloshes and snow boots, and the dealers must have ended the season well. I myself have invested for the first time in a pair of Boston storm slippers, and am very well satisfied with my purchase. These are retailed by the boot shops at 5s. per pair, against 3s. 9d. a pair for home-made goloshes, and I am told that they are becoming very popular. Owing to scarcity of labor, it has not been possible to clear the streets of snow with anything like the accustomed celerity, and this has made the wearing of goloshes more of a necessity; and again there is the fact that, while the price of leather boots has advanced, their wet-resisting properties have not improved, but, if anything, have shown a retrogression. All the circumstances, therefore, have been in favor of better rubber footwear trade.

ALL MANUFACTURING LINES ACTIVE.

With regard to business there is little of novelty to report. One cannot find a manufacturer who confesses to being slack, not even in the rubber heel trade, which is not supported by government orders as are the great bulk of the rubber manufacturers. A considerable amount of proofing for various classes of goods is still being done on government contracts, and the factories have very little opportunity to work for the home and export trade, although plenty of business is to be had owing to the depletion of warehouse stocks held by dealers and shippers. The labor question is becoming increasingly acute, owing to the demand for men by the military authorities, and the imminent severe revision of those engaged in "starred" trades will inevitably tend to further difficulties. Several important rubber works are now controlled by the ministry of munitions, and as there seems to be some misunderstanding as to the meaning of this, I may say that the control extends only to the particular article or articles which the firm is turning out for this ministry. Regarding the rest of the firm's business, whether it is concerned with other government departments or with private trade, the management remains, as before, entirely in the hands of the firm's officials, with no more supervision than is customary in the care of government contracts, and which is referred to in the specifications.

FOREIGN BUSINESSES CLOSED DOWN.

The fact that orders have been issued for the closing down of various British houses of enemy origin will remove a good deal of competition from the path of neutral and allied firms now trading in Great Britain. Four prominent firms to be wound up are the Calmon Asbestos & Rubber Works, Limited; the Peter Union Tire Co., Limited; the Harburg-Vienna Rubber Co., Limited, and the Rhenish Rubber & Celluloid Co., Limited. As I am confining my pen to the bare retailing of news I do not propose to make any comments on the personalities, whether of British or Teutonic origin, who have been so long known to many of us in their conduct of these businesses.

TRADE AFTER THE WAR.

A good many meetings have been held in the country to discuss the important question of trade after the war, and, although party politics are supposed to be defunct for the time being, or at any rate moribund, the main controversy underlying all the discussion is the old political one of free trade versus protection, a matter in which neutrals, allies and enemies are all

concerned. An important matter has been the defeat of the free trade directors of the Manchester chamber of commerce on a no change policy in the cotton trade. The majority of the members who brought about this defeat, which caused the resignation of most of the directors, belong to a great variety of trades, and cotton is poorly represented in the 29 nominations for the new board of 22 directors. Among these nominations is P. A. Birley, of Charles Macintosh & Co., and a director of the North Borneo Rubber Co., and Marshall Stevens, a director of the Xylos Rubber Co., Limited, though better known in America as the chairman and managing director of the Trafford Park estates. It may be taken that the great majority of the new board will be strong advocates of protective duties in manufactured goods, and development of interest may now be expected.

NORTH BRITISH RUBBER CO., LIMITED.

The new chemical research laboratory being erected by this concern is a model one. The room is very lofty, and is lighted by windows on three sides. The benches are designed to accommodate four research workers each. Artificial illumination on the "eye-rest" indirect system has been specially arranged to avoid shadows and glare. A few direct lighting units, installed for special purposes, are shaded to avoid any naked light sources in the line of vision. An electric blower has been installed for ventilation purposes. Steam, gas and electric power are supplied to the extraction bench, and high pressure water from the mains is supplemented as a precaution by a low pressure supply from a storage tank in the roof. Special attention is being devoted in the balance room to obviating the effect of vibration from the factory.

RUBBER BELTING.

At a meeting of the Manchester Association of Engineers held on March 4 a paper on "Rubber Belting" was read by Mr. James Tinto, of the Irwell & Eastern Rubber Co. The history of the rubber belt in England and America was given, and special mention was made of the large conveyor belts, which, originating in America, are being made by his firm and others on a scale quite equal to the mammoth products of America.

THE INDIA RUBBER MANUFACTURERS' ASSOCIATION.

J. T. Goudie, of the Leyland & Birmingham Rubber Co., Limited, occupied the chair at the annual meeting held in Manchester on February 22. There was a good attendance, and the various matters dealt with in the chairman's speech showed that the work of the past year had been largely concerned with matters which had arisen through the war, and were of great importance to the trade generally. The matter of import duties on foreign-made goods has been under discussion during the year, but beyond saying that complete harmony does not reign in the committee on this point I shall not enlarge on the topic. It is generally acknowledged that Mr. Goudie has made an excellent chairman, bringing wide business knowledge and considerable energy to his duties, which have been by no means light, and it is not surprising to find that he has been reelected chairman for the current year. Peter Bate, manager of the Castle Rubber Co., Warrington, was reelected vice-chairman, the following being elected to the committee: P. A. Birley, (Charles Macintosh & Co.); I. H. C. Brooking (St. Helens Cable & Rubber Co.); R. Eccles (F. Reddaway & Co.); Viscount Grimston (Grimston Tires); W. M. Henderson (Ancoats Vale Rubber Co.); F. Webster (Avon India Rubber Co.); David Moseley

(David Moseley & Sons), and J. Tinto (Irwell & Eastern Rubber Co.). Mr. Eccles continues to act as treasurer, and Reginald Moseley and James Henderson are the auditors unprofessional. No new firms are represented on the committee, which indicates that the abstention of several important rubber works in London and Scotland still continues.

BOOTS FOR THE BOYS IN THE TRENCHES.

Malcolm C. Cumming, the well known planter and chairman of the Planters' Association of Malaya, who some time ago started a scheme to purchase knee rubber boots for the British troops in the trenches, at a recent meeting of the Rubber Growers' Association, of the council of which he is a member, secured the support of that organization, which voted £150 [\$730] towards his fund, while individual members present at the meeting subscribed a further £800 [\$3,892], and the sum has been considerably increased since then. Mr. Cumming has also circularized rubber companies for help in cash and in rubber scrap. If the latter is donated a manufacturer has agreed to purchase it all at market prices, and furnish boots to its value at about 10s. [\$2.40] a pair. The retail price of this class of boots here is now 22s. 6d. [\$5.40] a pair. In case funds continue to be received Mr. Cumming will make trips to the continent to see that the boots reach the units for which they are intended.

RUBBER GROWERS' ASSOCIATION.

Apropos of the Rubber Growers' Association, the general meeting, which was held February 18, was a most interesting one. E. L. Hamilton, chairman of the association, presided, and in an extended address gave a complete review of the work of the association and its various committees during the year, covering among other points the reorganization, in which he spoke of the great value of the research work, commending the formation of local committees in Ceylon, Malaya and Southern India. He criticized the excess profits duty which has been levied by the government and which in the opinion of various members worked a hardship upon those companies in the intermediate stage of development. He told of the opening of a new fund for rendering assistance to those who have gone from British Malaya to take part in the war. Up to the time of the meeting, £12,000 had been donated or promised, and nearly 1,000 men have left Malaya to join His Majesty's forces, of whom over 600 are planters, while Ceylon has provided at least an equal number of men.

He highly praised the work of Malcolm Cumming, mentioned above, and gave some very interesting statistics of plantation rubber. He told of the demands for rubber created by the war, and called attention to the endeavors to induce the war office to experiment with rubber for tires on artillery and supply wagons, and as armor for vessels.

The chairman called attention to the devices resorted to by Germany to obtain rubber, and gave some interesting statistics of the plantation industry which are quoted here:

It is estimated that about 70 millions sterling of British capital is invested in the plantation industry, this figure representing the issued share and debenture capital, with the premium on shares and reserves put back into the estates.

The total area under rubber is approximately 1½ million acres, Malaya leading with 670,000 acres; Ceylon 224,000 acres; the Netherlands Indies 517,000 acres; Southern India and other countries 90 to 100,000 acres. Approximately 80 per cent of the total is British.

The world's production of rubber for 1915 is estimated at 146,000 tons, of which 98,000 tons are plantation; and for this year the estimated production of plantation rubber is between 130,000 and 135,000 tons, thus showing the remarkable development of the industry. For 1914 the production was but 71,380 tons and for 1910, 8,200; while in 1905 there were only 145 tons produced on plantations.

According to the Board of Trade figures, Great Britain retained 15,000 tons for home use against 18,500 for 1914. Russia's demand

was 16,000 tons for 1915 against 11,000 tons in the previous year, while France increased her consumption over 1914 by 2,000 tons. All these figures are approximate.

Shipments from Malaya to America increased from 5,700 tons in 1914 to 23,000 tons in 1915. With regard to Ceylon, there were 4,096 tons shipped direct to America as against 8,209 tons in 1915.

After speaking of the great prosperity of the rubber industry in America and estimating that the United States would need 75,000 tons for the manufacture of automobile tires alone, he concluded as follows:

As to the future of the rubber industry, I am afraid I must be excused from prophesying. This industry takes a high place in the world's commerce, and we must aim at making the plantation industry take the premier position. Coöperation is necessary to achieve success, and so long as we keep together and work with the ultimate object of benefiting the industry, that success is assured. We have common interests at stake, and our Association has been of infinite service in bringing us together to discuss many matters of policy and principle.

The industry is still, comparatively speaking, a young one, and therefore there is much for us to do. There is one thing to be said, I do not think we could have kept pace with the rapid strides made during the past years unless we had had the Rubber Growers' Association to represent the plantation industry.

The election resulted as follows: Charles Emerson, chairman; Sir Edward Rosling, vice-chairman; ordinary members of council, W. Arthur Addinsell, James F. Anderson, Sir John Anderson, F. W. Barker, Noel Bingley, Frank Copeman, E. L. Hamilton, T. G. Hayes, Captain W. R. Hoare, Arthur Lampard, John McEwan, Lieutenant R. K. Mayor, W. P. Metcalfe, H. K. Rutherford, G. A. Talbot, Noel Trotter; P. R. Rutherford, Auditor.

TRADE-MARK DECISION.

An interesting question regarding the use as trade-marks of names spelt backwards is brought up in the case of the "Gnidroc" trade-mark. J. C. Cording, Limited, and George Cording, Limited, are two firms, each making and selling waterproofs. J. C. Cording, as the older firm, objected to the registration by the George Cording firm of the word "Gnidroc" (Cording spelt backwards) as a trade-mark for rubber goods. Justice Neville in the lower court held, with the registrar, that the mark was an invented word, and therefore capable of registration. The Court of Appeals has recently reversed this decision, concluding that the use of the word "Gnidroc" was intended to secure the advantage of the word "Cording," and therefore calculated to deceive.

THE LATE J. E. BAXTER.

It is with great regret that I have to record the death of J. E. Baxter, principal of the firm of J. E. Baxter Co., Limited. Mr. Baxter was a well known personality in the trade, having been connected with the rubber industry during his whole business life. Some years ago he made a most strenuous trip to South Africa, and it seemed to me and to others that his health was somewhat seriously affected, and that he never really recovered the good health he enjoyed previous to that time. He was one of the first of our manufacturers to take a practical interest in rubber planting, and I remember, many years ago, being told by a mining engineer in London that he had been at a rubber plantation meeting in the city, when a man named Baxter got up in the hall and spoke about rubber in such an authoritative way that it made the remarks of the chairman and other speakers seem rather poor in comparison. Mr. Baxter was of a genial disposition, and will be much missed by a wide circle of friends.

George A. Morton, formerly assistant works manager of Pirelli & Co.'s cable works at Southampton, England, has resigned and accepted a similar position with the Dunlop Rubber Co., Limited, at its Birmingham factory.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

THE RUBBER TRADE IN GERMANY.

By Our Regular Correspondent.

CONDITIONS here have not improved since my last writing.

We are still isolated from those parts of the world which could furnish us the raw materials we need, and we all know that this state of affairs will continue until victory is won by our brave troops. In the meantime we continue to do as best we can with substitutes for all those materials which are no longer to be had. We have sufficient crude rubber for our military requirements, but none is available for other purposes. This situation is very difficult for those of our manufacturers who have not the good fortune to have orders for the army or for the navy.

WAR RUBBER QUALITIES.

I have already written much regarding war quality rubber goods, which are made wholly or largely of substitutes for crude rubber.

It cannot be denied that our rubber manufacturers have done wonders, and we can rely upon their doing better still. Our rubber industry has prevented the wheels of our other industries coming to a full stop, and at the same time it has kept our army and navy adequately supplied with the rubber goods they require in enormous quantities.

Prior to the war, crude rubber prices were so low that our manufacturers used less and less reclaimed rubber. Bitter necessity has obliged them to reverse this policy, and they are now using reclaimed rubber and substitute with the same skill that previously characterized their handling of crude rubber. Of course the substitute quality goods are not as good as standard qualities but, nevertheless, they answer their purpose. The regrettable feature of it all is that consumers generally fail to comprehend that present prices have little relation to quality. They are too ready to believe that war quality goods, because higher priced, should be at least as good as before-the-war standard qualities. The increasing demand for reclaimed rubber has naturally caused the prices to advance until now it costs much more than did crude rubber prior to the war. Of course goods made of such material are far less durable, and manufacturers cannot be blamed if the war qualities do not give the service that was obtained from normal products.

In this connection our rubber manufacturers should be grateful to your German contemporary, the "Gummi-Zeitung," for its incessant efforts to instruct dealers and consumers as to what they reasonably can expect from the goods the manufacturers have so much difficulty in producing.

War qualities vary considerably, their durability being naturally affected by the origin of the substitute used in manufacturing them. The variations in the quality of reclaimed rubber make it impossible for manufacturers to work on established formulas. The manufacturer has to take what he can get, and the reclaimer is not always able to obtain the chemicals he would prefer in order to turn out the best possible product.

CEMENT DIFFICULTIES.

One of the most difficult problems our manufacturers had to solve was the making of rubber cements from reclaimed rubber, especially those to be used in the manufacture of such articles as inner tubes for pneumatic tires, for which purpose the cements made from the best crude rubber are used in normal times.

POSSIBLE EFFECTS OF WAR QUALITIES.

Our rubber manufacturers and dealers in rubber goods are much concerned regarding the effect war quality goods may have upon the future of their business. Our rubber industry has proved that it is independent of foreign countries, and can do wonders even without importing crude rubber. As war qualities do not materially differ in appearance from standard qualities, there is much conjecture among dealers and consumers as to qualities after the end of the war. It is feared that manu-

facturers will continue to produce substitute goods along with regular qualities, and thus bring all qualities into disrepute. There is really no basis for this fear, for all our factories will return to crude rubber as soon as it is available at reasonable prices because of the fact that it is far more simple and less expensive to use crude rubber than it is to work as they are now doing with its substitutes.

TAXES AND WAR LOANS.

The authorization of war loans by the Imperial Parliament is generally considered as a matter of course, but it is not quite so with the imposition of new taxes, which will be necessary to cover these loans. Here opposition is evident, and to avoid it as long as possible the government is first turning its attention to taxing persons who have profited by the war. Thus we have the proposed "Excess Profit Tax," which, though it will not directly affect the masses of the people, is of much concern to our leading industries. This proposed "Excess Profit Tax" is very likely to become a law, and it is to be expected that it will prove especially severe upon our rubber manufacturing companies who have been put to great expense by the war, and who have already contributed their share to the defense of the fatherland by generously subscribing to the several war loans. Our rubber manufacturers are receiving high prices for their products, but it must not be forgotten that much has been expended for special machinery for handling war orders, and for experiments with substitutes, while the cost of both materials and labor is infinitely higher than in normal times.

CUSTOMS UNION.

A subject which is attracting much attention here is the agitation in favor of a customs union or "zollverein" between the Central European powers. Generally speaking such a proposition has always been favorably considered by German interests, whereas, in Austria-Hungary, many leading people were bitterly opposed to any closer economic union with Germany than existed before the war. In October last, however, the Vienna chamber of commerce adopted a definite policy in this connection, and gave the first official outlines of the proposition, at the same time bringing forward specific demands, and establishing a basis for negotiations, which have been making good headway and regarding which I hope to be able to write more at length in my next communication.

TRADE NOTES.

The Globus Gummi und Asbestwerke, G. m. b. H., Ahrensbock, near Lübeck, manufacturer of rubber and asbestos goods, has increased its capital from 200,000 marks [\$47,600] to 780,000 marks [\$185,640].

The Gummiwerke Max Bühlung, G. m. b. H., was recently incorporated at Eschweiler, near Aix-la-Chapelle, with a capital stock of 60,000 marks [\$14,280], to purchase and sell crude rubber, gutta percha and similar materials, also to reclaim scrap rubber, and to manufacture and sell rubber goods.

The Norddeutsche Gummi und Asbestmanufaktur Müller & Eggeling, Hanover, has been dissolved, and Gustav Eggeling, of the firm, has been made liquidator.

Karl Flothow has retired from the board of directors of the B. Pollack Co., Walterhausen, and the vacancy thus created has been filled by the election of Paul Strobel.

AUSTRIA-HUNGARY.

The Kaiser Franz Josef's Akademie der Wissenschaften (Kaiser Francis-Joseph's Academy of Sciences), Prague, Bohemia, has offered a prize of 5,000 crowns [\$1,015] for the best work on a substitute for rubber automobile tires.

DUTCH EMBARGO ON RUBBER EXPORTS.

The Netherlands Government has placed an embargo on all exports of rubber and gutta percha and goods made of or containing these materials.

EUROPEAN TRADE NOTES

SWITZERLAND.

GOTTlieb KELLER has formed a company for the whole-sale distribution of rubber mechanical and surgical goods at Biel, in the Canton of Berne.

FINLAND.

A special meeting of shareholders was recently held in Helsingfors by the Suomen Gummitehdas Osakeyhtiö, manufacturers of rubber footwear and general rubber goods. This company's paid-in capital now amounts to 908,200 Finnish marks [\$174,283].

NORWAY.

The great fire which on January 15, last, devastated a large section of the city of Bergen destroyed the premises of the firm of Klaus Reimer, 7 Olaf Kyrresgate, wholesale and retail dealers in packings and rubber mechanical goods.

SWEDEN.

The Svenska Gummifabriksaktiebolag, Gislaved, has resumed its manufacturing operations which for some time were suspended on account of the lack of crude rubber.

The Ryska Gummifabriksaktiebolag, Malmö, which had suspended its manufacturing of rubber footwear for the same reason, has also been able to resume operations.

Gustaf Janson has been made managing director of the firm of F. Reddaway & Co., Stockholm, wholesale dealers in belting and rubber mechanical goods.

The Skandinaviska Gummiaktiebolag, Viskafors, whose rubber footwear manufacturing department was burned in the latter part of 1915, has purchased the machinery and rented an abandoned footwear factory in Lidköping, and will resume the manufacture of rubber footwear.

Aktiebolaget Stockholms Gummifabrik is the name of a 200,000 crowns (\$53,600) corporation recently organized in Stockholm to manufacture rubber goods.

HOLLAND.

Wiese & Co., importers of crude rubber and gutta percha at Rotterdam and Amsterdam, Holland, call our attention to recent changes in that firm. M. J. Overeinder, who had for many years power of attorney for the firm, has been admitted to the partnership, and F. A. F. De Gruyter has been granted power of attorney at the Amsterdam branch of the concern.

RUSSIA.

The Russian correspondent of THE INDIA RUBBER WORLD, in a letter published in the March, 1916, issue of this paper, stated that the Russian-French India Rubber, Gutta-Percha and Telegraph Works "Prowodnik," formerly of Riga, now in Moscow, had materially increased its capital. Subsequent information shows that this increase amounts to 5,000,000 rubles (\$2,575,000), the company's capital now being 23,000,000 rubles (\$11,844,000), instead of 18,000,000 rubles (\$9,270,000).

JAPAN'S COMMERCE IN CRUDE RUBBER AND RUBBER GOODS.

By Our Regular Correspondent.

THE official statistics of Japan's commerce in crude rubber and manufactured rubber goods shows a very gratifying increase over that of 1914. The volume of crude rubber imported amounted to nearly 4,000,000 pounds, as compared with less than 1,000,600 pounds the previous year, while in value the increase amounted to \$708,479. The official figures of the imports with their sources, as compared with those of 1914, are as follows:

| From— | 1914. | | 1915. | |
|---------------------------|-----------|-------------|-----------|-------------|
| | Pounds. | Value. | Pounds. | Value. |
| British India | 406,676 | \$223,637 | 1,114,441 | \$470,329 |
| Straits Settlements | 1,646,556 | 678,730 | 2,017,176 | 863,593 |
| Dutch India | 13,034 | 1,678 | 299,774 | 113,083 |
| Great Britain | 224,500 | 159,312 | 352,164 | 196,865 |
| United States | 11,914 | 8,166 | 98,430 | 58,819 |
| Other countries | 2,582 | 1,786 | 21,565 | 13,109 |
| Total | 2,305,262 | \$1,073,319 | 3,903,550 | \$1,715,798 |

The first of the year importations were small on account of the embargo placed by the British government on all crude rubber exports from the British colonies. But this embargo was raised early in March, when an agreement was made with the Japanese government whereby it ruled that no crude rubber nor manufactured rubber goods should be exported from Japan to any country without the sanction of the British authorities. The result was that crude rubber was directly imported in April from the Straits Settlements and British India into Japan.

The main reason for the increased demand for crude rubber was due to the heavy exports of Japanese rubber goods to Russia, China, Great Britain and other countries, as well as to supply the deficiency at home because of the falling off of imports of rubber goods of foreign manufacture. The official figures of the imports of rubber goods show this decline of imports in many of the items of the following table:

IMPORTS OF RUBBER GOODS INTO JAPAN.

| | 1914. | | 1915. | |
|---|-----------|-------------|---------|-----------|
| | Pounds. | Value. | Pounds. | Value. |
| Reclaimed and unvulcanized rubber | 285,269 | \$43,368 | 168,060 | \$26,822 |
| Dental rubber | 20,464 | 39,142 | 15,527 | 29,003 |
| Soft— | | | | |
| Rods and cords | 105,193 | 44,264 | 55,910 | 22,941 |
| Plates and sheets | 88,856 | 25,195 | 72,641 | 18,656 |
| Tubes | 73,460 | 30,525 | 49,004 | 15,120 |
| Belts and beltings for machinery | 39,432 | 17,677 | 28,490 | 10,356 |
| Thread, strips, bands, rings and washers | 57,473 | 52,924 | 36,878 | 45,660 |
| Other soft goods | 30,105 | 21,774 | 5,878 | 4,386 |
| Hard— | | | | |
| Lumps, bars or rods, plates and sheets | 36,395 | 23,544 | 7,777 | 7,868 |
| Other hard goods | 15,080 | 10,541 | 11,304 | 2,512 |
| Bicycle tires | 182,226 | 215,950 | 37,348 | 40,735 |
| Insulated electric wires: Armored with metals—submarine telegraphic and telephonic cables | | 463,245 | | 154,637 |
| Other armored cables | 1,760,118 | 187,113 | 531,390 | 53,956 |
| Flexible cords | 14,330 | 4,730 | 40 | 31 |
| Other cords | 99,969 | 29,998 | 4,693 | 2,440 |
| Rubber boots (pairs) | 5,699 | 9,576 | 4,434 | 7,270 |
| Overshoes (pairs) | 25,343 | 12,488 | 21,500 | 11,454 |
| Beltings and hose | 389,370 | 183,625 | 173,984 | 94,984 |
| Waterproof tissue | 19,874 | 14,933 | 24,740 | 16,637 |
| Elastic webbing, cords and braids | | 32,178 | | 26,592 |
| Insulating tapes | 56,532 | 21,267 | 48,118 | 18,524 |
| Total | | \$1,489,057 | | \$610,584 |

In addition to the above imports of foreign goods into Japan, automobiles and parts (including tires) were imported to the value of \$82,633 in 1915, against \$249,211 in 1914, and bicycles and parts (exclusive of tires) to the value of \$156,501 in 1915, against \$517,548 in 1914.

It will thus be seen that the imports of rubber goods decreased 59 per cent from those of 1914, and about 77 per cent from 1913 figures. This decrease is a source of congratulation to Japanese manufacturers owing to their greatly enlarged trade, showing that they are now producing rubber goods recognized by the people of this country as equal to those of foreign make, or nearly so, the exception being some special goods on which, however, it is hoped they will be enabled to improve their production so as to almost entirely replace those of foreign manufacture. It is a notable fact that as soon as the embargo was raised against exporting Japanese manufactured goods to any country at war with Great Britain, Japanese manufacturers took advantage of the opportunity to fill orders which they already had on hand for export, and immediately started to give a wider scope to their foreign trade in China and other parts of Asia, Russia, and also to Australia, England and the United States.

Figures showing exports of goods manufactured of rubber, as given in the official report include:

| | 1914. | | 1915. | |
|---|---------|-----------|-----------|-------------|
| | Pounds. | Value. | Pounds. | Value. |
| Insulated electric wire..... | 995,999 | \$196,928 | 1,930,654 | \$449,776 |
| Rubber tires for jinrikishas and bicycles | | 543,135 | 2,512,969 | 1,706,315 |
| Total | | \$740,063 | | \$2,156,091 |

Other export figures include waterproofed cloth for surgical use in the Russian army, to the value of \$50,000; various soft rubber articles for British India, to the value of \$15,000; dolls, balls, balloons, toys, etc., to the United States and other countries, to the value of \$100,000, and similar articles to Russia, to the amount of \$50,000; the aggregate total value of these and other goods wholly or partly of rubber amounting to over \$210,000.

The prices of Pale sheet plantation rubber varied considerably during the year, as will be seen by the following table:

| PLANTATION RUBBER. | | | | | | | |
|--------------------|--------|----------------------|--------------|-------------------|------|----------------------|--|
| Prices per pound. | | Equivalent in cents. | | Prices per pound. | | Equivalent in cents. | |
| Yen. | Sen. | | | Yen. | Sen. | | |
| January 20.. | 1 10 | 55 | July 21..... | 1 26 | 63 | | |
| February 27. | 1 21 | 61 | August 26... | 1 30 | 60 | | |
| March | | | September 22 | 1 16 | 58 | | |
| April 27..... | 1 20 | 60 | October 27.. | 1 24 | 62 | | |
| May 21..... | 0 20 | 60 | November 26. | 1 50 | 75 | | |
| June 22.... | ..1 25 | 63 | December 16. | 1 58 | 79 | | |

MANUFACTURING SITUATION IN 1915.

Naturally, manufacturers were greatly hindered the first of the year by the shortage of crude rubber, but after the first of April imports were sufficient to enable them to run their factories to full capacity. Tire manufacturers benefited by the shortage of European goods, owing to the seizure of factories for uses of the armies. Some of the hard rubber manufacturers received orders for several thousand gross of poker chips and similar articles from Russia, and manufacturers of nursing nipples were enabled to export some 30,000 gross to British India. The United States sent orders for several hundred thousand gross of toy balloons, and Russia gave orders for waterproofed fabrics which required the consumption of more than a ton of crude rubber per month from May until the end of the year. All these, together with the very notable increase in the domestic demand, required manufacturers to push their works to full producing capacity. They had the same difficulty as manufacturers in other countries, owing to the greatly advanced cost of compounding ingredients. For instance, golden antimony and crimson antimony, because of the absence of imports from Great Britain, rose from 1 yen 20 sen [60 cents] a pound, to 4 yen [\$2] by the end of the year. These materials became so scarce that cinnabar was used as a substitute, and this has also advanced greatly in price because of the heavily increased demand for mercury. Zinc white, which cost 12 yen [\$6] per hundred weight in March and April, was quoted at 42 yen [\$21] by the end of the year, and machines, molds—in fact, nearly everything in the way of equipment, show proportionate advances.

CHANGES IN THE INDUSTRY.

Quite a number of new rubber factories were established in Japan during the past year. Seven of these are in Tokyo, eight in Osaka, Kobe and Hyogo. They are here listed.

Taisho Rubber Co., Ltd., Kitakamata, Tokyo. Capital \$25,000. Rubberized fabrics and goods.

Saito Rubber Cloth Works, 3 Chome, Kayabacho, Honjo, Tokyo.

Nipon Cristall Rubber Works, Tarashima, Tokyo. Dipped goods.

Chuo Rubber Co., Ltd., Komagomi-Sakashitacho, Tokyo. Capital, \$100,000. Molded specialties.

Kamada Rubber Works, Kami-Komagomi, Tokyo. Toy balls, heels, etc.

Taiheiyo Rubber Co., Kami-Meguro, Tokyo. Capital, \$6,000.

Kimura Rubber Works, 812 Somei, Tokyo. Soles, etc.

Hanhoku Rubber Works, Ebie, Sagisu-gun, Osaka. Capital, \$25,000.

Sango Shokai Rubber Works, Imamiya, Osaka.

Hinomaru Electric Wire & Rubber Co., Satsumabori-Minamicho, Osaka. Tires and insulated wire manufacture.

Kamada Rubber Manufacturing Co., Osaka.

Niwa Shoten Rubber Works, Osaka.

Futaba Rubber Co., Ltd. Fukiai-Kunika-dori, Kobe. Tires.

Toa Rubber Industry Co., Sugawara-dori, Hyogo. Capital, \$7,250.

Morinaga Rubber Works, Shiri-ike, Hyogo.

During the year the following concerns ceased business:

Nakajima & Co. (Tokyo), sold out to Saito Rubber Cloth Co.

Chuo Rubber Co. (Kami-Orchiai, Tokyo), whose factory was destroyed by fire and not rebuilt.

Kanto Rubber Cloth Co. and Teikoku Rubber Co., Limited (both in Tokyo), and Osaka Rubber Works, failed in business.

Teat & Co. (Kobe) is succeeded by the Standard Rubber Co.

It will thus be seen that though there were some trade misfortunes during the year, there is really an increased number of concerns in Japan who are manufacturing rubber goods of one description or another.

RUBBER CONDITIONS IN CEYLON.

By a Special Correspondent.

THE year 1915 was a very prosperous one for the rubber trade in Ceylon. Export figures show a remarkable expansion over 1914. Rubber exported from the island in 1915 amounted to 45,143,735 pounds as compared with 36,235,114 pounds in 1914, showing an increase of 8,908,621 pounds. Considering the restricted facilities of freight, these exports are truly remarkable, in regard to both demand and production.

A striking feature of our exports of crude rubber in 1915 is that the United States figures show an increase of 100 per cent over the previous year's record, being 18,585,890 pounds in 1915, as compared with 9,187,191 pounds in 1914.

Australia took 844,977 pounds of Ceylon rubber, as compared with 619,175 pounds in 1914. Offsetting these increases in part, the exports of crude rubber to the Continent of Europe show a decrease from 4,448,560 pounds in 1914 to only 925,732 pounds in 1915.

Russia purchased more Ceylon rubber in 1915 than in 1914. During 1915 we shipped to Russia 332,200 pounds of crude rubber as against 105,212 pounds in the previous year.

A feature of the Ceylon rubber trade in 1915 was the forward contracts by private treaty, large sales having been effected for 1916 at a rate of about 2.05 rupees [\$0.67] per pound. The subject of these forward contracts is being much discussed. We learn from London that shareholders rarely fail to criticize such contracts if there be a subsequent improvement in the price of rubber; at the same time, complaints are usually recorded if no contracts are made and the price of rubber afterwards declines. It is generally believed here that forward sales should be made whenever the price secured insures a reasonable profit. It is argued that selling forward is of importance to manufacturers, who can thus cover contracts for delivery of manufactured goods extending over a very long period and that, therefore, forward sales induce manufacturers to give preference to plantation rubber.

SCHOOL OF TROPICAL AGRICULTURE.

Probably one of the greatest events in the modern history of agriculture in Ceylon occurred on Saturday, January 15, when the School of Tropical Agriculture at Peradeniya was formally inaugurated by Sir Anton Bertram. The scheme was nearly 16 years old and was originated by Sir West Ridgeway, who first appointed a commission to consider what should be done with the Agricultural School then at Colombo. The object of the new school is to bring agricultural education within the reach of the natives.

UDAPUSSELLAWA PLANTERS' ASSOCIATION.

This association held its annual meeting on January 16. According to its report the year just closed was an exceptional one, the crops of every estate showing a gain over 1914. This was doubtless due to a continuance of rainfall during June, July and August.

SALE OF RUBBER SHARES.

When the little boom of rubber shares in London occurred, late in 1915, colonial holders of such shares were placed at a distinct disadvantage, compared with their British fellow-investors, because of the ruling of the Home Government that unless holders of stock residing abroad could prove physical possession in Great Britain on September 14, 1914, they would not be permitted to sell their holdings in the London market. Because of this disadvantage shares can be purchased in Ceylon at a lower rate than is possible in London, but, as a matter of fact, there are practically no sales of sterling shares here. The British Government can prevent the sale of rupee shares in London, but they cannot prevent London purchasers remitting money to Ceylon and having rupee shares purchased here on their account.



CEYLON TAPPER PARING THE CUTS.

Thus the purpose of the government's restriction, the prevention of sending money out of Great Britain, is frustrated, and purchases of shares continue, in spite of this legal obstacle.

RUBBER EXPORTS TO AMERICA.

In the latter part of January a rumor reached us from London that the export of crude rubber direct to America from British ports in the East was to be prohibited. This report caused some commotion, but was generally received with skepticism, for many of us believe that Mincing Lane has certain reasons for readily accepting any reported embargo on direct shipments from the East. As far as I have been able to learn from investigations here, all that has happened up to the present is an increased difficulty in obtaining permits from London. Should the rumored prohibition actually go into effect, shippers here would find themselves in the same position as at the outbreak of the war, when a similar prohibition was actually put into effect. This embargo was short-lived, but, had it lasted, it is probable that its effects would not have been too severe upon

our exporters, as our rubber would have continued to reach the United States via London.

Here at Ceylon, we are aware that some rubber has found its way from the United States to Germany, but we cannot see in this the necessity of discriminating against direct exports from Eastern ports, and it is difficult to see how there can be less control over shipments received in America from the East direct, than over those passing through London. We feel that it is entirely a question of the American manufacturers keeping their faith with the British Government and not permitting rubber to get into the hands of German agents. If the American manufacturers have failed to protect what are in fact their own interests we cannot blame the British Government for taking whatever steps they believe necessary to prevent our rubber reaching the enemy.

However, from all one is able to learn here, there is no question of prohibiting the export of rubber from here to America, but the applications for export permits have become so numerous that it has been found necessary to do something to check the movement. Already this year large quantities of rubber have been loaded here for New York, San Francisco, Seattle and other American ports. During the past few weeks applications for export permits have been received in such large quantities in London that, had all of them been granted, the result would have been that practically the entire output of the East in the period in question would have been shipped to the United States.

BROOMHALL'S RUBBER CODE.

Soon after the outbreak of the war, the British Government prohibited the use of cable codes in foreign cablegrams. Later, concessions were allowed for all recognized codes, including Broomhall's Code for general purposes, but not the Rubber Edition. This omission, which was solely due to lack of agitation on the part of those interested, has been corrected and the British authorities now sanction the use of Broomhall's Rubber Code, which is much used by the rubber interests here.

PLANTERS' ASSOCIATION OF CEYLON.

The 62nd annual meeting of this association was held recently, and the report submitted by the committee for the year 1915 touched several interesting subjects. The first half of the year was quite favorable for harvesting rubber crops, but the remainder was decidedly unpropitious, the production of most of the rubber estates being far behind their estimates. It has been found that the cost of tapping decreases as the yield increases, and the following table was submitted as giving the average costs for several years:

| | |
|-------------------------------|-----------------------|
| 200 pounds per acre..... | 20 cents per pound |
| 300 pounds per acre..... | 17 cents per pound |
| 400 pounds per acre..... | 13-14 cents per pound |
| Over 400 pounds per acre..... | 10-13 cents per pound |

It was found that some of the diseases which attacked the rubber trees were more virulent the past year, the principal ones being bark canker, leaf fall or *gleo spormin*, and die-back of renewed bark. This latter was the most serious, and was particularly severe during the wet weather. Various remedial treatments are being used experimentally, but no definite report as to their success was given. The increase of acreage under cultivation was very small. Thinning out is being continued on most estates, and it is believed that later on not more than 80 to 100 trees will be the rule, it having been found that in properly thinned out estates disease is less common and bark renewal much more rapid. The shortage of potash has brought about changes in fertilizing mixtures. A fair average yield per acre was pronounced to be 350 pounds where estates had been intelligently thinned out and cultivated. A few cases showed yields amounting to 500 pounds per acre.

RUBBER PLANTING IN THE FEDERATED MALAY STATES.

THE growth of the automobile industry has brought about a steadily increasing demand for high grade rubber. The world was long dependent upon South and Central America and the Congo region in Central Africa for its supplies of wild rubber. This condition is greatly changed today due to the successful cultivation in the Far East of the Para rubber tree (*Hevea Brasiliensis*). The original experiments in rubber cultivation made in Kew, England, resulted in a new and prosperous development in the Far Eastern tropical regions. Nowhere in the world has the rubber tree been found to thrive more luxuriantly or to yield a more abundant flow of latex than in the Malay Peninsula. The growth of the industry has been so rapid in the past decade that it seems destined to outstrip tin mining as the leading industry of the Federated Malay States.

Rubber is the leading agricultural product of Malaya and the government, recognizing the importance of the new industry, has done much to encourage the taking up of land by planters. In the early days, loans were granted from the public funds, repayable on easy terms, and loans are still granted to approved applicants. One of the handicaps to the development of the country was the scarcity of labor. The native population was altogether inadequate to cope with the rapid rise of the rubber planting industry. The pioneer planters endeavored to overcome this difficulty by importing labor, mostly from India and China, and, to a lesser extent, from Java. The government has coöperated in this effort to increase the labor supply and now there is a steady influx of free imported labor supervised and regulated by government officials. There is a fairly constant ebb and flow among these laborers, but the treatment and wages they

and medical treatment of the laboring classes throughout the country. Water supply systems have been installed in new planting districts as fast as conditions permit. The ex-



COOLIES GATHERING LATEX.

cellent road system is rapidly extending to give access to new estates, and the railway department keeps pace with the agricultural development by opening up new territories and providing new sidings at convenient centers. An agricultural department under a highly qualified director and a staff of trained mycologists, entomologists and chemists coöperates with the planters in detecting and combating enemies of the rubber tree.

For all purposes other than mining, State land is alienated by the issue of a grant in perpetuity, or of a lease for a term not exceeding one hundred years, upon payment of premium or purchase money, in amount according to the position and nature of the property. An annual quit rent is also reserved in all cases, which rent may be revised periodically at intervals of thirty years. Everything is done by the government to facilitate opening up the land by planters.

In order to encourage small capitalists to take up land in the Malay States, the government has set aside small blocks of land for planting purposes, and arrangements have been made for assigning four young men to the forests and agricultural departments for periods of six months. During this time they have the opportunity of acquiring knowledge of the country, the people, their language and customs, as well as familiarizing themselves with market conditions.

Bulletins of the agricultural department give valuable information in regard to rubber cultivation and other agricultural subjects.

The following statistics show the growth of the rubber industry in British Malaya:

| Malaya. | Acreage under Rubber. | Quantity Exported. Pounds. |
|-----------|-----------------------|----------------------------|
| 1905..... | 38,000 | 1,977 |
| 1906..... | 99,230 | 935,056 |
| 1907..... | 179,227 | 2,278,870 |
| 1908..... | 241,138 | 3,539,922 |
| 1909..... | 292,035 | 6,741,509 |
| 1910..... | 362,853 | 14,368,863 |
| 1911..... | 542,877 | 24,904,043 |
| 1912..... | 621,621 | 42,462,401 |
| 1913..... | 637,747 approx. | 52,557,409 |
| 1914..... | 653,873 approx. | 68,761,280 |
| 1915..... | 670,000 approx. | 99,733,760 |



TAPPING ON A MALAY PLANTATION.

receive causes every man and woman returning to India or China to advertise favorably the Malay States, which results in bringing an increasing supply of laborers to the country.

Quarantine stations have been established by the government, which also exercises a praiseworthy care in the housing

Rubber Planting Notes.

DECLINE OF WILD RUBBER IN FRENCH INDO-CHINA.

WITH the development of Eastern rubber plantations, the gathering of wild rubber is becoming a rapidly declining industry. The recently published report of a French military, geological and topographical commission which explored the Laos country of French Indo-China in 1913, contains interesting notes on rubber gathering.

The Laos country is located in the French protectorate of Annam and Siam and embraces all the upper reaches of the Mekong river. Rubber vines, which furnish most of the crude rubber that is exported from Vinh and other ports of Annam, grow wild in the forests covering the slate hills of the central districts of the Laos country.

In these rubber districts most of the natives neglect all agricultural pursuits to devote themselves exclusively to the gathering of rubber, which they sell to French traders in such centers as Luang-Prabang, Vientiane, Xienhouang, Kham-Keut and Na-Pe.

The rubber sold at Luang-Prabang comes from Muong-Phoun, from the valley of the Nam-Ta (Vien-Poukha) river and also from the forest districts of Siam. The Siamese rubber is carried on pack elephants to Thadua and from there down the river to Luang-Prabang.

The rubber marketed at Vientiane is obtained partly from the Muong-Phoun district and from the Pou-Nieni mountains, which are parallel to the Mekong, south of Muong-Phoun. Xienhouang, Kham-Keut and Na-Pe receive their rubber from the mountains near Muong-Mo as well as from the Muong-Phoun district. The Muong-Phoun rubber reaches Xienhouang by pack horse caravans. The rubber purchasing season begins in January. In 1913 the natives were receiving from 1.20 to 2 Straits Settlements dollars per kilogram [30 to 50 cents per pound] for dry rubber.

From the trading centers the rubber is sent by river boats and parcel post to the ports of shipment on the seaboard.

The French explorers were unable to obtain any definite figures as to the quantities of rubber handled at the different trading points, but they learned that Xienhouang was by far the leading center and that Luang-Prabang was second in importance. Also that the industry was fast declining owing to the destructive methods of the native gatherers.

RUBBER WASHING IN WEST AFRICA.

At the present time difficulty is being experienced in the *Manihot* rubber industry in West Africa, apparently due to the over-washing of the product. *Manihot* rubber should be treated differently than *Hevea*, as it is much more resinous than the latter and is consequently softer. Repeated washings are said to result in loss of "nerve" and cause the formation of oxidized films, rendering the rubber unsuitable for first-class manufacture. Too extended drying in the producing country has been suggested as the cause of the oxidation of the rubber, as the water in *Manihot* rubber is supposed to contribute to its preservation.

South Cameroon rubber acts in a somewhat similar manner. It comes in small cubes that are damp and lose 30 per cent in weight. This rubber has long given good results to manufacturers. It is purchased by trade-marks and without samples.

EXPORT TARIFF ON CRUDE RUBBER FROM BRITISH EAST AFRICA.

The British "Customs Tariff Amendment (No. 3) Ordinance of 1915" reduces the export duty on rubber other than plantation rubber, from the British East Africa Protectorate, from 10 per cent ad valorem to 4 per cent ad valorem.

PUBLICATION OF "ALL-IN" COSTS BY RUBBER PLANTATION COMPANIES.

Rubber plantation companies, in general, place the so-called "all-in" cost of production of rubber before their shareholders. Opinions are divided, however, as to the wisdom of giving these details to the public. Officials of some plantation companies believe it injudicious to enable purchasers to learn the cost of production, reasoning that a buyer paying \$1.00 for an article which to his knowledge costs but 25 cents to produce will naturally make it his aim to reduce as much as possible the profit he knows the seller is making. By boasting of the low cost of production the rubber grower arms the rubber dealer with a weapon which the latter will use against him. The practice of publishing "all-in" costs is certainly peculiar, for in few other lines of business is it customary to take the public so completely into confidence as to the costs of production.

WORLD'S ACREAGE OF PLANTATION RUBBER.

It is estimated by the Rubber Growers' Association of London that the total area of planted rubber is approximately one and a half million acres, which is divided as follows: Malaya, 670,000 acres; Ceylon, 224,000 acres, Dutch East Indies, 517,000 acres; Southern India and other countries, 90,000 to 100,000 acres.

PARA RUBBER SEED.

According to the "Gardens' Bulletin," Straits Settlements, from observations over a period of eighteen years at the Botanic Gardens, Singapore, it is estimated that about 1,400 trees are required to yield 2,000 pounds of Para rubber seed, or 1,200 pounds of kernels. It was further noted that a large crop of seed is usually followed by an insignificant crop at the next seeding.

RUBBER PLANTING IN ST. LUCIA, B. W. I.

According to the annual report of Archibald J. Brooks, F.L.S., F.C.S., agricultural superintendent for St. Lucia, British West Indies, labor conditions in that island render the cultivation and preparation of rubber unprofitable although both *Castilloa elastica* and *Hevea Brasiliensis* grow and thrive well on the island. Samples of *Castilloa* rubber grown in St. Lucia were sent to the Imperial Institute in London, which reported it to be of good quality although of undesirable dark color and a rather high percentage of resin.

THE BATAVIA, JAVA, RUBBER TRADE ASSOCIATION.

This association recently published its first report, which covers the year 1915. Starting with 40 subscribers, 67 new ones were registered in the course of the year, bringing the total on December 31, 1915, to 107.

During the year covered by the report 21 auctions were held, rubber to the amount of 262 tons was offered, and 136 tons sold.

The report makes no mention of forward sales in Java during 1915, although there are reasons to believe many such sales were made.

BALATA POACHERS.

Some time ago seven or eight balata bleeders deserted from the service of the British Guiana Companies, crossed the Rupununi Savannah to the Brazilian side of the Takutu river, and there began bleeding operations on their own account. Using the old-time destructive methods of cutting down the bullet-trees, they soon had collected a considerable quantity of balata, estimated at 10,000 pounds, and are now reported to be on their way down the Rio Branco for Manaos.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED FEBRUARY 15, 1916.

- N**O. 1,171,449. Retreading old casings. Cornelius D. McGiehan, Jersey City, N. J.
- 1,171,502. Vehicle tire rim. W. L. Burgess, assignor to the Firestone Tire & Rubber Co.—both of Akron, Ohio.
- 1,171,503. Demountable rim. H. N. Carragher, Fall River, Mass.
- 1,171,597. Hard rubber storage battery separator. J. N. Davis, Denver, Colo.
- 1,171,652. Fountain pen. V. V. Riesberg, assignor of one-half to F. H. Dougherty—both of Philadelphia, Pa.
- 1,171,664. Metal reinforced rubber valve disk. W. F. Schacht, Huntington, Ind.
- 1,172,100. Fountain pen. C. M. V. Allenou, Nantes, France.
- 1,172,153. Spring wheel with cushion tire. C. S. Martin, Rockville, Md.
- 1,172,197. Hot water bag. C. P. Cook, Marshalltown, Iowa.
- 1,172,234. Resilient wheel with rubber cushioned hub. J. B. Drahonovsky, assignor to J. B. D. Holding Co.—both of Milwaukee, Wis.
- 1,172,242. Demountable rim. C. H. McKendree, assignor of one-tenth to E. H. Smith, one-tenth to F. P. Lane, one-tenth to W. A. Massingill, one-tenth to C. D. Arthur, and one-tenth to M. Sanders—all of Lakeview, Ore.

ISSUED FEBRUARY 22, 1916.

- 1,172,287. Locking device for demountable automobile wheel rims and the like. F. D. Hiller, Jr., Webster Groves, assignor to Hil-Ko Rim Lock Co., St. Louis—both in Missouri.
- 1,172,392. Rubber heel plate. H. G. Robinson, Oakland, Cal.
- 1,172,425. Rim for vehicle wheels. R. S. Bryant, assignor to The Standard Welding Co.—both of Cleveland, Ohio.
- 1,172,450. Pneumatic suction cleaner employing a length of rubber tubing. W. T. Griffin, assignor of one-third to A. A. Hancock—both of Washington, D. C.
- 1,172,477. Safety valve for pneumatic tires. G. Mizener, Decorah, Iowa.
- 1,172,509. Rubber footwear retainer. T. C. Wilder, Cattaraugus, N. Y.
- 1,172,543. Piston rod packing formed of alternate interlocked layers of fabric and rubber. C. I. E. Mastin, Midland Park, N. J.
- 1,172,552. Waterproof thigh guard. G. L. Pierce, Brooklyn, N. Y., assignor to A. G. Spaulding & Bros., New York City.
- 1,172,573. Emergency tire composed of links and block fillers. A. J. Westburg, Springfield, Ill.
- 1,172,610. Resilient wheel. M. F. Kettler, assignor to Downing Pneumatic Wheel Co.—both of Houston, Tex.
- 1,172,671. Detachable rubber heel for footwear. C. H. Chapman, Winchester, Mass., assignor to Chapman Detachable Rubber Heel Co., a corporation of Maine.
- 1,172,879. Apparatus for administering oxygen to persons in a state of collapse by apnoxylation or other causes. R. H. Davis, London, England.
- 1,172,889. Dyeing comb having a compressible reservoir. C. M. Holden, San Francisco, Cal.
- 1,172,927. Combination bathing cap and bag. F. A. Bloch, New York City.
- 1,172,996. Elastic waist adjusting band. W. C. Hynard, assignor to Hynard & Jung Co.—both of New York City.
- 1,173,008. Pressure regulator for pneumatic tires. G. D. Lewis, Genesee, Pa.
- 1,173,032. Tooth brush formed of a plurality of indented elastic layers. H. Reiche, Millstone, N. J.
- 1,173,061. Fire hose coupling. N. Tregloun, Hancock, Mich.
- 1,173,085. Moistening device with perforated rubber top. D. G. Beeching, New York City.
- 1,173,088. Friction plug rubber heel. F. Berenstein, Chelsea, Mass.
- 1,173,124. Rubber tread vehicle wheel. E. G. Schleicher, Stamford, Conn.

ISSUED FEBRUARY 29, 1916.

- 1,173,176. Nursing bottle and nipple. M. C. Coombs, New York City.
- 1,173,211. Spring hose coupling. W. F. O'Donnell, Trenton, N. J.
- 1,173,221. Split rim for vehicle wheels. N. Schenk, St. Louis, Mo.
- 1,173,222. Demountable rim for vehicle wheels. N. Schenk, St. Louis, Mo.
- 1,173,243. Combination demountable rim and felly band. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.
- 1,173,287. Rubber welt for shoes. J. E. Lucas, Brockton, assignor to F. R. Woodward, Waban—both in Massachusetts.
- 1,173,349. Pocket clasp comprising an endless elastic band. J. W. Hawkins, Mundfordville, Ky.
- 1,173,424. Detachable tire tread. G. A. Hagstrom, Kansas City, Mo., and E. Hagstrom, Chicago, Ill.; said E. Hagstrom assignor to said G. A. Hagstrom.
- 1,173,482. Inflatable life preserver. C. O. Carlson, Manor, Tex.
- 1,173,502. Combined pneumatic tire and protector. J. F. Geisendorfer, Weimar, Calif.
- 1,173,538. Typewriter pad of cellular or spongy rubber. L. R. Roberts, Rutherford, N. J., assignor to Underwood Typewriter Co., New York City.
- 1,173,561. Bath mat. E. R. Crooker, Los Angeles, Calif.
- 1,173,696. Health shoe comprising a strip of elastic material adapted to act as an arch support. L. Zerge, assignor of one-half to H. J. Rosecrant—both of Philadelphia, Pa.
- 1,173,755. Collapsible drinking cup. W. O. Straight, Pullman, Wash.

- 1,173,790. Vehicle wheel comprising a plurality of cushions interposed in annular formation. F. A. Frommann, assignor to O. Frommann—both of Chicago, Ill.
- 1,173,814. Resilient wheel tire. J. L. Plant, Malone, N. Y.
- 1,173,853. Protector for pneumatic tires. W. H. Paul, Baltimore, Md.
- 1,173,865. Fountain pen. F. C. Ries, Macon, Ga.
- 1,174,028. Resilient vehicle tire. W. B. Buckley, Washington, D. C.

ISSUED MARCH 7, 1916.

- 1,174,054. Boot or shoe comprising a rubber inner-sole of silk and a sole of rubber vulcanized to the sheet. G. F. Butterfield, assignor to G. I. Butterfield—both of West Newton, Mass.
- 1,174,109. Hard rubber mouthpiece for smoking pipes. O. Wartemann, New York, assignor to Traun Rubber Co., College Point—both in New York.
- 1,174,117. Tire valve. J. A. Bowden, Los Angeles, Cal., assignor to A. Schrader's Son, Inc., New York City.
- 1,174,166. Rubber hip boot. W. P. Kilner, Buffalo, N. Y.
- 1,174,168. Tire valve. H. P. Kraft, New York, and M. C. Schweinert, West Hoboken, N. J.
- 1,174,170. Pneumatic tire comprising superimposed laminations of rubber and metal. M. E. Lesem, Cape Girardeau, Mo.
- 1,174,179. Hot water bottle, stopper and heating attachment. C. A. Rickards, Chicago, Ill., assignor to A. Schrader's Son, Inc., New York City.
- 1,174,238. Pneumatic tire casing. B. C. Dowse, Cudahy, Wis.
- 1,174,254. Tire repair device. C. F. Jenkins, Washington, D. C.
- 1,174,350. Twin tire wheel rim. A. A. Remington and J. G. Sweeney—both of Birmingham, England.
- 1,174,359. Rubber gasket with inner ring. G. M. Shaffer, Denver, and E. A. Franklin, Fort Morgan—both in Colorado.
- 1,174,380. Wheel rim. W. P. Bailey, Mill Valley, Calif.
- 1,174,397. Sole pressing form comprising a rubber pad. H. A. Davenport, Brockton, Mass., assignor to United Shoe Machinery Co., Paterson, N. J.
- 1,174,430. Horseshoe pad. A. McTernan, Andover, and J. A. Hale, Boston, assignors to McTernan Rubber Manufacturing Co., Reading—all in Massachusetts.
- 1,174,476. Pneumatic tire protector. B. Cohen, New York City.
- 1,174,556. Inflatable life preserver. B. Franklin, assignor to American Life Buoy Co.—both of Chicago, Ill.
- 1,174,557. Inflatable life preserver. B. Franklin, assignor to American Life Buoy Co.—both of Chicago, Ill.
- 1,174,619. Rubber heel retaining grip. W. M. Scholl, Chicago, Ill.
- 1,174,620. Cushion heel. W. M. Scholl, Chicago, Ill.
- 1,174,621. Resilient heel. W. M. Scholl, Chicago, Ill.
- 1,174,780. Smoke helmet with air tube and respirator. J. A. Tychon, Cloquet, Minn.
- 1,174,799. Method of repairing boots and shoes. J. W. Arthur, Warren, Ohio.
- 1,174,856. Filler for automobile tires. F. A. Hager, Portland, Ore.
- 1,174,909. Tire shoe or casing patch. G. L. Stuart, San Diego, Cal.

ISSUED MARCH 14, 1916.

- 1,174,954. Rubber type in band form. M. O. Anthony, assignor to The Tagograph Co.—both of New York City.
- 1,174,968. Wheel rim. D. J. Canary, Oak Park, assignor of one-half to C. M. Richter, Chicago—both in Illinois.
- 1,174,976. Adjustable elastic band for garments and the like. T. R. Gaines, Montreal, Quebec, Canada.
- 1,175,054. Nipple for nursing bottle. H. C. Dunfee, St. Albans, W. Va.
- 1,175,055. Resilient wheel comprising a pneumatic tube. J. L. Firm, Berwyn, Ill.
- 1,175,095. Syringe. S. G. Walker, assignor of one half to R. Ruffner—both of Welch, W. Va.
- 1,175,151. Resilient vehicle wheel with solid rubber tire. S. Johnstone, Sacramento, Calif.
- 1,175,154. Cushion tire. A. S. Krotz, Janesville, Wis.
- 1,175,240. Elastic garment support. F. A. Cook, Grand Rapids, Mich.
- 1,175,249. Detachable massaging device for brushes and the like. F. Eisenhut, Newark, N. J.
- 1,175,373. Elastic tube for fire hose. H. C. Noack, Chicago, Ill.
- 1,175,387. Pedal pad. J. Stanley, Newark, N. J.
- 1,175,411. Demountable rim for tires. F. J. Croop, Warsaw, Ind.
- 1,175,431. Cushion tire. J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.
- 1,175,491. Bathing appliance. J. Wald, New York City.
- 1,175,532. Hose coupling. C. H. Lambkin, New York City.
- 1,175,606. Cushioning material for absorbing shock. L. P. Clutter, Beaver Falls, Pa.
- 1,175,624. Tire casing formed of layers of rubber and granular particles of aluminum distributed between the layers of fabric. J. H. Fawkes, Portland, Ore.
- 1,175,671. Resuscitator comprising a sheet of flexible elastic material. T. E. Acklen, Memphis, Tenn.
- 1,175,684. Detachable resilient heel. A. Beckelman, New York City.
- 1,175,799. Respirator. F. Niessner, Johnstown, Pa.
- 1,175,866. Integral rubber sole comprising a forepart, a thicker heel portion and a connecting shank portion. C. H. Hill, Lynn, Mass.

- 1,175,884. Dust cap for valve stems. G. F. Fisher and A. Bailey—both of Plainfield, N. J., assignors to Revere Rubber Co., Providence, R. I.
 1,174,995. Apparatus for impregnating tire fabric. F. W. Kremer, Carlstadt, N. J.
 1,175,517. Machine for forming hose bands. H. Gibbs, assignor to W. D. Allen Manufacturing Co.—both of Chicago, Ill.
 1,175,681. Pneumatic tire mold. G. E. Batcheller, New York City.

THE DOMINION OF CANADA.

ISSUED DECEMBER 31, 1915.

- 166,425. Rubber glove. The Sterling Rubber Co., assignee of J. B. Abler—both of Guelph, Ontario, Canada.
 166,468. Tread for footwear. P. G. Dunham, Tilbury, Ontario, Canada.
 166,497. Vehicle tire fitted with interior spring blocks in place of an inner tube. V. Mongeau, Outremont, Montreal, Quebec, Canada.
 166,515. Suction tread for footwear. R. Smith, Sherbrooke, Quebec, Canada.
 166,521. Tire pressure regulator. C. H. Thayer, Elmira, New York City.
 166,554. Hollow resilient automobile tire. The Ruckings Tyre Syndicate, Limited, Westminster, assignor to H. Diamant, 14 Westbourne Terrace Road, Middlesex—both in England.
 166,593. Elastic inserts for skirt bands. E. Caplan, Philadelphia, Pa.
 166,597. Pneumatic tire for automobiles. W. Henry, Clay, Camcon, Colo.
 166,633. Nursing brassiere having a front portion of light waterproof material. L. Lawrence, Vancouver, British Columbia, Canada.
 166,671. Military coat. The Canadian Consolidated Rubber Co., Limited, assignee of L. Fedderman—both of Montreal, Quebec, Canada.
 166,718. Air tube for pneumatic tires. J. A. Burgess, Toronto, Ontario, Canada.
 166,754. Curtain device for bath tubs. A. E. Lang, Buffalo, N. Y.
 166,879. Tire core. H. J. S. Keim, Catasqua, Pa.
 166,899. Automobile tire tool. W. J. Reid, Gananoque, Ontario, Canada.
 166,905. Tire inner tube. E. L. Scranton, Rising Sun, Ind.
 166,906. Cushion tire. W. Shimon, Pocahontas, Iowa.
 166,920. Tire comprising an outer casing of rubber and a filler of hollow rubber balls. H. E. Wolken, Leigh, Nebraska.

THE UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent upon the filing of the application.

*Denotes Patents for American Inventions.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, FEBRUARY 16, 1916.]
 21,241 (1914). Device for wiping automobile glass wind shield. K. Black, 188 Clarendon Park Road, Leicester.
 21,312 (1914). Parachute with waterproof casing and rubber rings. E. R. Calthrop, Eldon Street House, Eldon street, London.
 *21,386 (1914). Life saving apparatus comprising a waterproof bag. P. M. Freely, 11 Bonner place, New York City.
 21,458 (1914). Toy with rubber tubular legs. J. Isaacs, Highgate Park Works, Alcester street, Birmingham.
 21,489 (1914). Apparatus with rubber mouthpiece and gas bag for administering gases. P. S. O'Donnell, Plaza Hotel, Chicago, Ill.; H. E. C. Van Heck, 36 Hindes Road, Harrow, Middlesex, and A. D. Wheatley, 26 South Audley street, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, FEBRUARY 23, 1916.]
 21,502 (1914). Inflatable swimming belt, etc. J. J. Pritchard, 4 Reddings Road, Moseley, Birmingham.

- *21,535 (1914). Tire casing with cork filling. E. M. Deal, 5713 Spruce street, and J. J. Brooks, 304 South Tenth street—both in Philadelphia, Pa.
 21,616 (1914). Rubber padded non-slip attachment for horseshoes. A. J. Sumner, Blanford Villa, Cheltenham, Gloucestershire.
 21,633 (1914). Protective band for inner tubes. E. K. Fuller, Hemingford Grey, St. Ives, Huntingdonshire.
 21,656 (1914). Combined waterproof cloak and sleeping bag. M. Earle, 53 Queen's Road, St. John's Wood, London.
 21,767 (1914). Endless hatband, belt, garter, etc., having an elastic section. R. Neill and P. Isles—both of 20 Great Charlotte street, Liverpool.
 21,778 (1914). Flexible rubber connection for coupling metal pipes. J. S. Irving, Kenilworth, Osborne Road, South Farnborough, Hampshire.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MARCH 1, 1916.]
 21,850 (1914). Waterproof trench coat adapted for wear under an overcoat; also for use as a ground sheet. A. H. Mills (trading as A. H. Mills & Co.), 9 Grace street, and E. C. Laverack, 130 Hyde Park Road—both in Leeds.

- 21,867 (1914). Milking machine test cups, the lining of which consists of a plain rubber tube. C. H. Davis, 10 Church Place, Wanganui, New Zealand.
 21,874 (1914). Balata impregnated driving and conveyor belts. Aktieselskabet Ronlunds Fabriker, 19 Sortebrodtorvet, Odense, Denmark.
 *21,890 (1914). Fountain syringe for irrigation purposes. Meinecke & Co., 48 Park Place, New York City, assignees of C. W. Meinecke, 31 Sherman Place, Jersey City, N. J.
 21,930 (1914). Waterproof apron for use on carriages, etc. A. W. Austen, 6A Station Road, Maidstone.
 22,031 (1914). Blanket capable of being converted into a sleeping bag or waterproof cape. D. F. Burrage, "Langmoor," Egmont Road, Sutton, Surrey, and Lothbury Supply Association, 5 Moorgate street, London.

- 22,059 (1914). Guard for fountain pens to be attached to the wearing apparel by an elastic cord. W. Farquhar, 40 Westbourne Gardens, Bayswater, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MARCH 8, 1916.]

- 22,117 (1914). Device for lessening effects of collisions comprising rubber ring and packing. P. Penza, 17 Via Barbaziana, Bologna, Italy.
 22,214 (1914). Hose nozzle with rubber disk. M. Buckley, 8 Brook street, Thornton Lodge, Huddersfield.
 *22,262 (1914). Vehicle spring with rubber bumpers. J. Frosig, 751 West Fourth street, and L. W. Walstrom, 611 Eureka avenue—both in Reno, Nev.
 22,267 (1914). Life-saving waistcoat with an inflatable tube of rubber. Gieve, Matthews & Seagrove, 22 The Hard, Portsmouth, and J. W. Gieve, 65 South Molton street—both in London.
 22,401 (1914). Toy. H. D. Evans, 8 Brockenhurst Gardens, Addiscombe, Croydon.
 22,433 (1914). Rubber bands used in laying submarine mines. Soc. Schneider et Cie, Le Creusot, Saone-et-Loire, France.

THE GERMAN EMPIRE.

PATENTS ISSUED (With Dates of Validity).

- 290,213 (August 19, 1913). Surgical sewing material. Supplement to patent No. 287,150. Firm of M. Esbach, Klingenthal-in-Sa.
 290,216 (May 8, 1914). Packing disc. Firm of Paul Lechler, Stuttgart.
 290,217 (December 10). Resilient tire. Enan McDurmond Deal and John Joseph Brooks, Philadelphia, Pa., U. S. A. Represented by M. Schmetz, patent lawyer, Aix-la-Chapelle.
 290,730 (March 19, 1912). Stamped fastening button for attaching rubber suction discs to rubber mouth dams. Adolf Pochwaldt, 162, Hauptstrasse, Berlin-Schöneberg.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

- *77,823 (June 26, 1915). Elastic tire for vehicle wheels. T. H. Kep.
 477,853 (March 2). Elastic wheel for automobiles, motor cycles and other vehicles. Miss E. Murray.
 477,887 (March 5). Improved elastic tires. L. E. Pickett.
 477,997 (May 12). Improved buffer springs, coupling springs and others, made up with rubber. F. Spencer.
 478,059 (March 16). Pneumatic tire casing. D. R. Shewan.
 478,067 (March 17). Improved anti-skid devices for automobile wheels. The National Steam Car Co., Limited, and Crawley-Boevey.
 478,093 (March 19). Elastic wheel with a hollow rim. DeLandaluce y Salazar.
 478,100 (March 20). Improvements in vehicle wheels. S. Ramsbotham.
 478,161 (March 26). Mud guard for automobiles and other vehicles. P. Christensen.
 478,216 (March 31). Improvements in elastic wheels for vehicles. B. O. Bergesen.
 478,224 (July 24, 1914). New application, to the wheels of automobiles and other vehicles, of means to decrease the heating of the rubber, the "blowing-out" of pneumatic tires and to make and replace parts of tires. L. A. Mousseau.
 478,231 (April 1, 1915). Elastic tire with segments (rings), for vehicle wheels. E. Thorez.

NEW ZEALAND.

ISSUED JANUARY 20, 1916.

- 36,807. Puncture proof inner tube. A. E. Henderson, 503 Kent Building, Toronto, Canada.

TRADE-MARKS.

THE UNITED STATES.

ISSUED FEBRUARY 15, 1916.

- 81,399. Abercrombie & Fitch Co., New York City. The initials A & F. For tennis balls, footballs and sporting goods.
 88,841. The Mechanical Rubber Co., Jersey City, N. J. The word *Champion*. For garden hose composed of rubber and rubber fabric.
 90,098. The Portage Rubber Co., Barberton, Ohio. The word *Summit*. For rubber vehicle tires.
 90,620. Samstag & Hilder Bros., New York City. Illustration of a seal with a crown and lion with the word *Colonial*. For dress shields, hose supporters, rubber hair pins, etc.
 91,163. Franklin-Caro Co., Richmond, Va. Representation of a beehive and a bee with the words *Honey Fruit*. For chewing gum.
 91,775. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Celia*. For light weight rubber shoes.
 91,776. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Ada*. For light weight rubber shoes.
 91,777. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Sheba*. For light weight rubber shoes.
 91,882. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Amy*. For light weight rubber shoes.
 91,884. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Ines*. For light weight rubber shoes.
 91,885. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Santa*. For light weight rubber shoes.
 91,886. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Komo*. For light weight rubber shoes.

- 91,887. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Fawn*. For light weight rubber shoes.
 91,888. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Cherub*. For light weight rubber shoes.
 91,973. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Nemo*. For light weight rubber shoes.
 91,974. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Tris*. For light weight rubber shoes.
 91,975. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Leda*. For light weight rubber shoes.

ISSUED FEBRUARY 22, 1916.

- 84,001. The B. F. Goodrich Co., New York City. The initial *G* between two sprigs. For raincoats and rubber boots and shoes.
 90,685. United & Globe Rubber Manufacturing Co., Trenton, N. J. Illustration of a circle with the word *Oylproof*. For rubber hose, belting, packings, rubber dredging sleeves, etc.
 90,782. Automatic Selling & Advertising Co., New York City. Illustration of a diamond printed in red and blue with the words *Al-Chew-Tru-Blu-Gum*. For chewing gum.
 90,900. J. P. Gorman, New York City. Illustration of a chauffeur with the casing of a tire in his hands and the words *Rubber Putty First "Fixes Everything of Rubber."* For plastic compounds, called "Rubber Putty" for mending rubber articles.
 91,959. Garter Plate Co., Inc., New York City. Representation of a garter with the word *King*. For garters.

ISSUED FEBRUARY 29, 1916.

- 88,743. G. W. McGann, Bristol, R. I. The word *Vulcan*. For a pipe joint compound.
 89,531. Pirelli & Co., Milan, Italy. Illustration of a circle with a star in the center of same and the initials *P & C M* and the word *Stella*. For surgical syringes.
 90,857. United Drug Co., Boston, Mass. Illustration of a signet with the word *Signet*. For rubber goods.
 91,666. J. P. Smith Shoe Co., Chicago, Ill. The illustration of a spear with the word *Chicagoans*. For shoes of canvas and rubber and of leather and rubber, etc.

ISSUED MARCH 7, 1916.

- 79,715. Maryland Rubber Co., Baltimore, Md. Illustration of a man with a globe on his shoulders with the word *Atlas*. For druggists' sundries.
 90,670. The British Aeroplane Varnish Co., Limited, Newcastle-upon-Tyne, England. The word *Planoline*. For preparation for the preservation and waterproofing of textile fabrics, leather, etc.
 90,671. The British Aeroplane Varnish Co., Limited, Newcastle-upon-Tyne, England. The word *Titanine*. For filling and waterproofing material for the textile wings of aeroplanes, airships, and other aircraft.
 91,069. The Goodyear's Metallic Rubber Shoe Co., Naugatuck, Conn. The word *Naugasole*. For rubber boots and shoes.
 91,488. E. L. Swaine, Los Angeles, Cal. Illustration of a series of miniature pictures with the words *Movie Gum*. For chewing gum.
 92,030. United States Tire Co., New York City. The word *Usco*. For rubber tires for vehicles.
 92,072. United States Tire Co., New York City. The word *Royal*. For rubber tires for vehicles.

ISSUED MARCH 14, 1916.

- 90,769. C. W. Meinecke, New York City. Illustration of a nipple with a band around the neck of same and the words *Anti-Colic Brand*. For nipples.
 91,428. Independent Gum Co., Memphis, Tenn. The word *Spearmint* in white letters on a black background. For chewing gum.
 91,471. F. V. Canning, New York City. The word *Pepsinets*. For chewing gum.
 92,306. Samstag & Hilder Bros., New York City. A coat of arms with the word *Colonial*. For elastic webbing, etc.

THE DOMINION OF CANADA.

ISSUED DECEMBER 31, 1915.

- 21,282. Canadian Consolidated Rubber Co., Limited, Montreal, Quebec. The word *Rubberhide* on the outline of the sole of a shoe. For footwear.
 21,318. Gutta Percha & Rubber, Limited, Toronto, Ontario. The word *Efficiency*. For mechanical rubber goods.
 21,334. Willard's Chocolate's Limited, Toronto, Ontario. The words *Butter Nuts* on disk encircled by band bearing the words *Chewing Gum Brand*. For chewing gum.

DESIGNS.

THE UNITED STATES.

ISSUED FEBRUARY 15, 1916.

- 48,561. Tread surface for tires. P. S. Malickson, Philadelphia, Pa.
 48,571. Pneumatic vehicle tire. R. G. Null, Indianapolis, Ind., assignor to G. & J. Tire Co., a corporation of New Jersey.

ISSUED FEBRUARY 22, 1916.

- 48,586. Rubber brush. O. Eick, St. Louis, Mo.

ISSUED FEBRUARY 29, 1916.

- 48,627. Rubber boot. M. H. Clark, Milford, Conn., assignor to The Goodyear's Metallic Rubber Shoe Co., a corporation of Connecticut.
 48,636. Pneumatic tire. R. Griffith, Akron, Ohio.

ISSUED MARCH 7, 1916.

- 48,690. Rubber tire. E. C. McGraw, East Palestine, Ohio.
 ISSUED MARCH 14, 1916.

- 48,730. Rubber tire. E. C. McGraw, East Palestine, Ohio.

THE DOMINION OF CANADA.

ISSUED DECEMBER 31, 1915.

- 3,948. Tread surface for rubber tires. Hyslop Brothers, Limited, Toronto, Ontario.

YEARLY EXPORTS AND IMPORTS OF CRUDE AND MANUFACTURED RUBBER BY COUNTRIES.

EXPORTS—CRUDE RUBBER.

| | 1914 | | 1915 | |
|------------------------------|------------|-----------|------------|-----------|
| | Pounds. | Value. | Pounds. | Value. |
| Ceylon— | | | | |
| To Great Britain | 24,122,962 | ..... | 25,183,748 | ..... |
| The Continent | 4,539,249 | ..... | 1,031,192 | ..... |
| United States | 9,175,591 | ..... | 18,607,691 | ..... |
| Japan | 303,206 | ..... | 264,901 | ..... |
| Straits Settlements | 60,346 | ..... | 119,933 | ..... |
| India | 1,550 | ..... | 1,530 | ..... |
| Australia | 817,654 | ..... | 964,697 | ..... |
| Canada & Newfoundland | 124,422 | ..... | 392,495 | ..... |
| Totals | 69,366,080 | ..... | 46,566,187 | ..... |
| Singapore— | | | | |
| To Great Britain | 29,326,477 | ..... | 29,934,533 | ..... |
| The Continent | 2,042,220 | ..... | 4,765,333 | ..... |
| Japan | 1,259,823 | ..... | 2,315,915 | ..... |
| Ceylon | 297,245 | ..... | 338,450 | ..... |
| United States | 10,732,448 | ..... | 48,340,967 | ..... |
| Australia | 175,964 | ..... | 372,459 | ..... |
| Totals | 43,834,177 | ..... | 86,067,657 | ..... |
| Penang— | | | | |
| To Great Britain | 19,513,200 | ..... | 23,129,931 | ..... |
| The Continent | 533,333 | ..... | 801,599 | ..... |
| Ceylon | 905,333 | ..... | 516,666 | ..... |
| United States | 960,701 | ..... | 4,132,467 | ..... |
| Totals | 21,912,567 | ..... | 28,580,663 | ..... |
| Port Swettenham— | | | | |
| To Great Britain | 27,652,992 | ..... | 28,188,454 | ..... |
| The Continent | 1,816,538 | ..... | 24,640 | ..... |
| Ceylon | 1,572,660 | ..... | 1,572,215 | ..... |
| United States | 244,209 | ..... | ..... | ..... |
| Totals | 31,286,399 | ..... | 29,785,309 | ..... |
| Malacca— | | | | |
| To Great Britain | 5,265,628 | ..... | 7,881,651 | ..... |
| United States | 15,878 | ..... | ..... | ..... |
| The Continent | 36,873 | ..... | 17,333 | ..... |
| Totals | 5,318,379 | ..... | 7,898,984 | ..... |
| Federated Malay States | 69,366,080 | ..... | 99,733,760 | ..... |
| Liberia | 8,003 | ..... | 10,081 | ..... |
| Brazil | 75,109,440 | ..... | 78,769,600 | ..... |
| Rangoon | 710,192 | \$429,120 | 429,120 | \$339,790 |

EXPORTS—CHICLE.

| | | |
|------------------------|---------|----------|
| Mexico—Tampico: | | |
| To United States | 347,817 | \$57,728 |

IMPORTS—CRUDE RUBBER.

| | | | | |
|---------------------------|-----------|-------------|-----------|-------------|
| Japan— | | | | |
| From British India | 406,676 | \$223,637 | 1,114,441 | \$470,329 |
| Straits Settlements | 1,646,556 | 678,730 | 2,017,176 | 863,593 |
| Dutch Indies | 13,034 | 1,678 | 299,774 | 113,083 |
| Great Britain | 224,500 | 159,312 | 359,164 | 196,865 |
| United States | 11,914 | 8,166 | 98,430 | 58,819 |
| Totals | 2,302,680 | \$1,071,523 | 3,881,985 | \$1,702,689 |

IMPORTS—GUTTA PERCHA.

| | 1913 | | 1914 | |
|-----------------------|---------|-------------|---------|-----------|
| | Pounds. | Value. | Pounds. | Value. |
| Holland— | | | | |
| From France | | \$133,200 | ..... | \$12,400 |
| Great Britain | | 69,600 | ..... | 219,600 |
| Dutch Guiana | | 783,600 | ..... | 297,600 |
| Java, etc. | | 660,000 | ..... | 283,600 |
| Other countries | | 94,800 | ..... | 45,200 |
| Totals | | \$1,741,200 | ..... | \$858,400 |

IMPORTS—RUBBER MANUFACTURES.

| | | | | |
|-----------------------|-------|-------------|-------|-------------|
| Holland— | | | | |
| From Belgium ..... | ..... | \$937,200 | ..... | \$966,800 |
| Great Britain ..... | ..... | 3,419,200 | ..... | 908,400 |
| Germany ..... | ..... | 1,166,800 | ..... | 3,408,000 |
| Russia ..... | ..... | 46,000 | ..... | 42,400 |
| United States ..... | ..... | 509,200 | ..... | ..... |
| Other countries ..... | ..... | 36,400 | ..... | 4,800 |
| Totals ..... | ..... | \$6,431,200 | ..... | \$5,695,200 |

| | | | | |
|--------------------------|-------|---------|-------|---------|
| Rangoon— | | | | |
| From United States ..... | ..... | \$3,300 | ..... | \$2,430 |

| | 1912-1913 | | 1913-1914 | |
|--------------------------|-----------|----------|-----------|----------|
| | Pounds. | Value. | Pounds. | Value. |
| Norway— | | | | |
| From United States | | \$39,613 | ..... | \$43,708 |

IMPORTS—GUTTA PERCHA MANUFACTURES.

| | 1913 | | 1914 | |
|-----------------------|---------|-----------|---------|-----------|
| | Pounds. | Value. | Pounds. | Value. |
| Holland— | | | | |
| From Belgium | | \$231,200 | ..... | \$201,200 |
| Great Britain | | 62,400 | ..... | 70,400 |
| Germany | | 160,800 | ..... | 88,400 |
| Other countries | | 400 | ..... | 400 |
| Totals | | \$454,800 | ..... | \$360,400 |

| | 1912-1913 | | 1913-1914 | |
|--------------------------|-----------|-----------|-----------|-----------|
| | Pounds. | Value. | Pounds. | Value. |
| Newfoundland— | | | | |
| From Great Britain | | \$21,000 | ..... | \$26,000 |
| Canada | | 48,000 | ..... | 46,000 |
| United States | | 66,000 | ..... | 79,000 |
| Totals | | \$135,000 | ..... | \$151,000 |

Review of the Crude Rubber Market.

NEW YORK.

A GENERALLY quiet tone has prevailed in the crude rubber market during the month of March. Trading has been steady and the volume of business comparatively small. The large manufacturers appeared to be limiting their purchases to moderate quantities, while dealers were equally conservative in their operations. Quotations were generally firm with minor fluctuations that resulted in an average decline of 2 to 3 cents during the month.

Shipments of plantation rubber from the East by way of the Pacific coast continue to increase. This is an entirely new route and just when the rubber in transit will reach its destination is uncertain. The intercontinental railroads are short of cars and congested with freight. Rubber that was shipped from the East in December last, is only just arriving, having consumed 8 to 10 weeks in transit across the continent. It is extremely doubtful, therefore, that very much rubber will be shipped in the future by this route.

New York arrivals have shown increasing volume. The total figures for the first three weeks of March were 6,200 tons divided as follows: Plantations from Singapore and Ceylon 1,670 tons; Batavia 645 tons; London and Liverpool 1,435 tons; Paras from Brazil 1,990 tons; West coast 35 tons; Africans 350 tons; Centrals 75 tons. Para sorts from Brazil appear to be in the lead thus far for the month. The present indications are that March arrivals will exceed those of February, which amounted to 6,885 tons. The steamship Suldanha da Gama cleared from Para for New York on February 5, with about 200 tons of rubber. This steamer has not yet arrived and according to rumors, never will, as the cargo is destined for Germany.

On March 1 First latex, nearby, was quoted at 92 cents, May-June deliveries sold at 90 cents and July-December at 86 cents. Amber and Brown crepes ranged from 87 cents to 90 cents, depending on the color and position. Smoked sheets, nearby, sold for 91 cents. May-June deliveries sold for 89 cents and July-December for 86 cents. Nearby Upriver fine and Upriver coarse were quoted at 77 cents and 60 cents, respectively. Nearby Islands fine and Islands coarse were quoted at 70 cents and 38 cents, respectively. Upper caucho ball, nearby, was 60 cents. Cameta spot sold for 40 cents.

During the month the decline was noticed in the various sorts, and on March 30 First latex, nearby, sold for 88½ cents. Futures were not quoted. Amber and Brown crepes sold at 86 to 87 cents. Smoked sheets, nearby, were quoted at 88 cents. Futures were not quoted. Upriver fine and Upriver coarse were 74½ cents and 58 cents. Nearby Islands fine and Islands coarse were 69 and 38 cents. Upper caucho ball, nearby, sold for 59 cents, and Cameta, nearby, 40 cents.

LONDON.

A review of the London market for the past month failed to disclose any unusual features worthy of special mention. The underlying tone has been quiet with prices firm and practically unchanged. The actual rubber movement during the past few weeks has been comparatively small. London plantation imports during February amounted to only 3,831 tons, as against 5,360 tons in January, and 5,722 tons in February, 1915. Stocks for February last were 7,342 tons, as compared with 7,351 tons in January and 7,172 tons in February, 1915.

SINGAPORE.

The effective solution of the freight situation seems to be as remote as ever. Ocean rates have advanced and may go higher. The relief promised by the government's proposed plan of commandeering the entire British tonnage is too far distant. Meanwhile shipments to the United States are being diverted by the way of Japan and the Pacific coast. Between January 6 and

February 1, 4,400 tons were shipped from Singapore by this route.

We are advised by cable that 955 tons of rubber were sold at the Singapore auctions on March 9, 16 and 23. Average price obtained for Pale crêpe was 78 cents and for Smoked sheet 80 cents. Market steady and prices firm.

CEYLON.

During the period of February 17 to February 26, 7,822,641 pounds of rubber were exported, against 5,297,000 pounds in the same period of 1915, an increase of 2,525,641 pounds.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and March 30, the current date:

| Para. | April 1, '15. | March 1, '16. | March 30, '16. |
|---|----------------------------------|--|-----------------|
| Upriver, fine, new..... | 58 @ 60 | 77 @ 78 | 74 @ 74½ |
| Upriver, fine, old..... | 59 @ 60 | 72 @ 71 | 70 @ |
| Islands, fine, new..... | 53 @ | 70 @ | 70 @ |
| Islands, fine, old..... | | | |
| Upriver, coarse, new..... | 46 @ | 59 @ 60 | 57½ @ |
| Upriver, coarse, old..... | | | |
| Islands, coarse, new..... | 30½ @ | 37 @ 38 | 38 @ |
| Islands, coarse, old..... | | | |
| Cameta..... | 34 @ | 40 @ 41 | 40 @ |
| Caucho, ball, upper..... | 47½ @ | 61 @ 62 | 59 @ |
| Caucho, ball, lower..... | 44 @ | 58 @ 59 | 55 @ |
| PLANTATION HEVEA. | | | |
| Smoked sheet | | Spot 92@93 | 87½ @ |
| ribbed..... | { Spot 65 @ } { Afloat 62 @ } | { Apr.-June 92@93½ } { July-Dec. 89 @ } | 84 @ |
| First latex crepe..... | { Spot 62 @ } { Afloat 61 @ } | { Spot 93@94 } { Apr.-June 93@94½ } { July-Dec. 90 @ } | 88 @ 84 @ 85 |
| Fine sheets and biscuits, unsmoked..... | | Spot 91 @ | 82 @ |
| CENTRALS. | | | |
| Corinto..... | 46 @ 47 | 57 @ 59 | 58 @ |
| Esmeralda, sausage..... | 46 @ | 57 @ 59 | 58 @ |
| Nicaragua, scrap..... | 43 @ 44 | 56 @ 57 | 57 @ |
| Mexican plantation, sheet..... | | 60 @ | |
| Mexican, scrap..... | | 53 @ | |
| Mexican, slab..... | | 38 @ 40 | 41 @ |
| Manicoba..... | 37½ @ | 50 @ 52½ | 48 @ 50 |
| Mangabeira, sheet..... | 40 @ | 42 @ 45 | 40 @ 42 |
| Guayule..... | | 48 @ | |
| Balata, sheet..... | | 66 @ 67 | 70 @ 71 |
| Balata, block..... | | 45 @ 46 | 44 @ 58 |
| AFRICAN. | | | |
| Lopori, ball, prime..... | | | 75 @ |
| Lopori, strip, prime..... | | | |
| Upper Congo, ball, red..... | | 62 @ | 65 @ |
| Rio Nunez Niggers..... | | 72 @ 73 | 73 @ |
| Conakry Niggers..... | | 74 @ 75 | 72 @ |
| Massai, red..... | 52 @ 54 | 74 @ 75 | 72 @ |
| Soudan, Niggers..... | | | |
| Cameroon, ball, soft..... | 37 @ 40 | 46 @ | |
| Benguela, No. 1..... | | 50 @ | |
| Benguela No. 2..... | | 46 @ 48 | 46 @ |
| Accra, flake..... | 22½ @ 23 | 38 @ 40 | 41 @ |
| EAST INDIAN. | | | |
| Assam..... | | 58 @ | 55 @ |
| Pontianak..... | | 10 @ 10½ | 10½ @ |
| Gutta Siak..... | | 15 @ 16½ | 16 @ |
| Gutta red Niger..... | | 27½ @ | 27 @ |
| Borneo III..... | | | 35 @ |
| Gutta Percha..... | | 1.50 @ 2.00 | 1.50 @ 2.00 |

RUBBER AFLOAT TO THE UNITED STATES.

| PLANTATION. | | | |
|-------------------------|--------------------|---------------------|-----------|
| FROM PENANG. | | | |
| Steamship. | Cleared. | To. | Pounds. |
| Ping Suey..... | Jan. 15, 1916..... | *New York..... | 11,200 |
| Ping Suey..... | Jan. 15, 1916..... | *Akron..... | 61,600 |
| Tosa Maru..... | Jan. 18, 1916..... | Seattle..... | 2,266 |
| Benalder..... | Jan. 25, 1916..... | *New York..... | 62,666 |
| Benalder..... | Jan. 25, 1916..... | *Seattle..... | 106,666 |
| Benalder..... | Jan. 25, 1916..... | *Akron..... | 51,466 |
| Benalder..... | Jan. 25, 1916..... | *San Francisco..... | 10,000 |
| Namur..... | Jan. 27, 1916..... | *New York..... | 18,133 |
| Namur..... | Jan. 27, 1916..... | *Seattle..... | 3,066 |
| Hakata Maru..... | Jan. 28, 1916..... | *New York..... | 28,266 |
| Hakata Maru..... | Jan. 28, 1916..... | Seattle..... | 17,600 |
| Totals from Penang..... | | | 310,263 |
| FROM SINGAPORE. | | | |
| Suruga..... | Jan. 6, 1916..... | Boston..... | 6,666 |
| Suruga..... | Jan. 6, 1916..... | *New York..... | 1,795,200 |
| Hai Yang..... | Jan. 12, 1916..... | *New York..... | 436,533 |
| Hai Yang..... | Jan. 12, 1916..... | Seattle..... | 285,684 |
| Knight Companion..... | Jan. 13, 1916..... | *New York..... | 780,843 |
| Knight Companion..... | Jan. 13, 1916..... | Seattle..... | 571,900 |
| Knight Companion..... | Jan. 13, 1916..... | Akron..... | 278,800 |
| Atrous..... | Jan. 15, 1916..... | *New York..... | 264,800 |
| Atrous..... | Jan. 15, 1916..... | *Seattle..... | 102,144 |

* Via Hong Kong.

| | | | |
|----------------------|---------------------|---------------------|-----------|
| Japan | Jan. 19, 1916 | New York | 392,800 |
| Japan | Jan. 19, 1916 | Seattle | 208,133 |
| Japan | Jan. 19, 1916 | Akron | 229,466 |
| Ping Suey | Jan. 20, 1916 | New York | 4,666 |
| Ping Suey | Jan. 20, 1916 | Akron | 255,466 |
| Lai Sang | Jan. 20, 1916 | New York | 56,000 |
| Antiochus | Jan. 21, 1916 | New York | 29,333 |
| Yat Shing | Jan. 24, 1916 | San Francisco | 74,266 |
| Kathlamba | Jan. 27, 1916 | Boston | 116,533 |
| Kathlamba | Jan. 27, 1916 | New York | 2,100,800 |
| Van Spilbergen | Jan. 29, 1916 | San Francisco | 11,333 |
| Van Spilbergen | Jan. 29, 1916 | Akron | 28,933 |
| Namur | Jan. 30, 1916 | New York | 197,866 |
| Namur | Jan. 30, 1916 | Seattle | 11,200 |
| Namur | Jan. 30, 1916 | Akron | 132,266 |
| Benalder | Feb. 1, 1916 | San Francisco | 164,000 |
| Benalder | Feb. 1, 1916 | Akron | 121,333 |
| Benalder | Feb. 1, 1916 | New York | 170,800 |

Totals from Singapore.....8,827,764

GUTTA JELUTONG (PONTIANAK).

FROM SINGAPORE.

| | | | |
|-----------------|---------------------|----------------|---------|
| Suruga | Jan. 6, 1916 | Boston | 112,133 |
| Suruga | Jan. 6, 1916 | New York | 598,533 |
| Kathlamba | Jan. 27, 1916 | New York | 258,133 |

Totals from Singapore.....968,799

GUTTA PERCHA.

FROM SINGAPORE.

| | | | |
|-----------------|---------------------|----------------|---------|
| Suruga | Jan. 6, 1916 | New York | 112,000 |
| Kathlamba | Jan. 27, 1916 | Boston | 22,400 |
| Kathlamba | Jan. 27, 1916 | New York | 134,533 |
| Suwa Maru | Feb. 2, 1916 | New York | 22,666 |

Totals from Singapore.....301,599

BORNEO.

FROM SINGAPORE.

| | | | |
|-----------------|---------------------|----------------|--------|
| Suruga | Jan. 6, 1916 | New York | 8,800 |
| Kathlamba | Jan. 27, 1916 | New York | 11,600 |

Totals from Singapore.....20,400

*Via Hongkong.

New York

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, New York City), advises as follows: The market for commercial paper has continued very free through March, there being a good general demand, the best rubber names selling readily at 4 per cent, and those not so well known $4\frac{1}{2}$ to $5\frac{1}{2}$ per cent, according to grade.

NEW YORK PRICES FOR MARCH.

| | 1916.* | 1915. | 1914. |
|----------------------|-------------|-------------|-------------|
| Upriver fine | \$0.74@0.78 | \$0.58@0.60 | \$0.73@0.76 |
| Upriver coarse | .56@.59 | .45@.47 | .43@.46 |
| Islands fine | .68@.71 | .51@.53 | .68@.70 |
| Islands coarse | .34@.39 | .30@.32 | .31@.33 |
| Cametá | .36@.40 | .34@.37 | .35@.36 |

* Figured only to March 27.

Plantation Rubber from the Far East.

TOTAL EXPORTS FROM MALAYA.

(From January 1, 1915, to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

| To— | Singapore. December 31, 1915. | Malacca. December 31, 1915. | Penang. December 31, 1915. | Port Swet- tenham. December 31, 1915. | Totals. |
|---------------------|-------------------------------------|-----------------------------------|----------------------------------|--|-------------|
| Great Britain..... | 29,934,533 | 7,881,651 | 23,129,931 | 28,188,454 | 89,134,569 |
| Continent | 4,765,333 | 17,333 | 801,599 | 24,640 | 5,608,905 |
| Japan | 2,315,915 | ..... | ..... | ..... | 2,315,915 |
| Ceylon | 338,450 | ..... | 516,666 | 1,572,215 | 2,427,331 |
| United States | 48,340,967 | ..... | 4,132,467 | ..... | 52,473,434 |
| Australia | 372,459 | ..... | ..... | ..... | 372,459 |
| Totals, 1915..... | 86,067,637 | 7,898,984 | 28,580,663 | 29,785,309 | 152,332,613 |
| Totals, 1914..... | 43,834,177 | 5,318,379 | 21,912,567 | 31,286,389 | 102,351,512 |
| Totals, 1913..... | 27,857,983 | ..... | 16,042,267 | 28,877,774 | 72,778,024 |
| Totals, 1912..... | 14,649,707 | ..... | 9,684,831 | 20,254,269 | 44,588,807 |

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to February 14, 1915 and 1916. Compiled by the Ceylon Chamber of Commerce.)

| To— | 1915. | 1916. |
|-------------------------------|-----------|-----------|
| Great Britain | 3,494,859 | 2,096,550 |
| Canada and Newfoundland | 340,140 | ..... |
| Russia | 94,719 | 18,695 |
| France | 35,840 | ..... |
| Japan | 21,656 | ..... |
| Australia | 17,101 | 56,576 |
| United States ..... | ..... | 3,290,537 |
| Totals | 4,004,315 | 5,462,358 |

(Same period 1914, 3,623,505 pounds; same period, 1913, 1,839,521.) The export figures of rubber given in the above table for 1914 include the imports

re-exported. (These amount to 541,630 pounds.) To arrive at the total quantity of Ceylon rubber exported for that period, deduct these imports from the total exports. The figures for 1915 and 1916 are for Ceylon rubber only.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur gives the export of plantation rubber from the Federated Malay States for the month of February at 5,207 tons. This is the highest amount exported in one month from these States, and compares with 4,471 tons in January, and 3,411 tons in the corresponding month last year. Appended are the comparative statistics for three years:

| | 1914. | 1915. | 1916. |
|----------------|-------|-------|-------|
| January | 2,542 | 3,473 | 4,471 |
| February | 2,354 | 3,411 | 5,207 |
| Totals | 4,906 | 6,884 | 9,678 |

SINGAPORE.

Guthrie & Co., Limited report (February 9, 1916):

The rubber cataloged for to-day's auction met with a good inquiry and of 298 tons offered 270 tons changed hands. Demand throughout was good and all prices show substantial improvements.

Fine ribbed smoked sheet sold up to \$174, an increase of \$19, while Fine crêpe at \$172 showed an advance of \$15 on the week.

Fine and good brown crêpes were wanted and for most parcels there was keen competition.

The following was the course of values:

| | In Singapore Picul.* | Sterling equivalent per pound in London. | Equivalent per pound in cents.† |
|--|-------------------------|--|---------------------------------------|
| Sheet, fine ribbed smoked.... | \$165@174 | 3/ 1¼@3/ 3¼ | 76.27@80.07 |
| Sheet, fair to good ribbed smoked | 160@165 | 3/ 0¼@3/ 1¼ | 74.24@76.27 |
| Sheet, plain smoked | 161@166 | 3/ 0¼@3/ 1¼ | 74.50@76.77 |
| Sheet, ribbed, unsmoked | 159@167 | 3/ 0¼@3/ 2 | 73.73@77.03 |
| Sheet, plain, unsmoked | 147@166 | 2/ 9¼@3/ 1¼ | 68.66@76.77 |
| Crêpe, fine pale | 169@172 | 3/ 2½@3/ 3¼ | 78.04@79.31 |
| Crêpe, good pale | 163@169 | 3/ 1¼@3/ 2½ | 75.51@78.04 |
| Crêpe, fine brown | 158@167 | 3/ 0¼@3/ 2 | 73.23@77.03 |
| Crêpe, good brown | 153@160 | 2/ 11¼@3/ 0¼ | 71.20@74.24 |
| Crêpe, dark | 147@154 | 2/ 9¼@2/ 11¼ | 68.66@71.71 |
| Crêpe, bark | 139@152 | 2/ 3¼@2/ 10¼ | 65.12@70.69 |
| Scrap, virgin | 117@118 | 2/ 3¼@2/ 3¼ | 55.49@56.25 |
| Scrap, pressed | 137@— | 2/ 7¼@— | 64.36@— |
| Scrap, loose | 94@133 | 1/ 10¼@2/ 6¼ | 46.12@62.58 |

* Picul = 133 1/3 pounds.

† Figured at standard rate of exchange, 1s. = 24.3 cents.

Quoted in S. S. dollars = 2/4 [56 cents].

MARKET CABLE SERVICE FROM SINGAPORE.

The following reports of the weekly auctions held at Singapore have been cabled by the Waterhouse Co., Ltd.:

| Date. | Crêpe. | Smoked Sheet. | Total Pounds. | Market. |
|---------------|--------|---------------|------------------|--------------------------|
| Mar. 9. cents | 78.5 | 78.5 | 851,200 | Prepared for an advance. |
| Mar. 16. | 79.3 | 78.5 | 804,000 | Steady—improved demand. |
| Mar. 23. | 77.7 | 77.7 | 504,000 | Weaker—less demand. |

STRAITS SETTLEMENTS RUBBER EXPORTS.

The Colonial Secretary cables from Singapore that the export of plantation rubber from Straits Settlements ports for the month of February amounted to 3,359 tons compared with 4,443 tons in January and 2,741 tons in the corresponding month last year. Appended is a comparison of the statistics for three years:

| | 1914. | 1915. | 1916. |
|----------------|-------|-------|-------|
| January | 1,181 | 2,576 | 4,443 |
| February | 1,703 | 2,741 | 3,359 |
| Totals | 2,884 | 5,317 | 7,802 |

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements such as Borneo, Java, Sumatra and the non-Federated Malay States as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

RUBBER AND GUTTA EXPORTS FROM JAVA AND MADURA.

| PLANTATION, TO— | November. | | Eleven Months Ending November 30. | |
|---------------------|------------------------|------------------|--------------------------------------|------------------|
| | 1914. Pounds. | 1915. Pounds. | 1914. Pounds. | 1915. Pounds. |
| Holland | Ficus | 2,640 | 3,494 | 42,247 |
| | Hevea | 4,400 | 235,400 | 2,283,600 |
| | Hevea (to order) ..... | ..... | ..... | 499,400 |
| | Manihot (Ceara) ..... | ..... | ..... | 134,275 |
| | Castilloa ..... | ..... | 550 | 51,630 |
| Totals | 7,040 | 239,444 | 3,011,152 | 2,822,288 |
| Great Britain | Ficus ..... | ..... | 2,706 | 41,780 |
| | Hevea | 508,200 | 270,600 | 3,709,200 |
| | Manihot (Ceara) | 1,965 | ..... | 29,819 |
| | Castilloa | 4,312 | 1,848 | 27,914 |
| Totals | 514,477 | 275,154 | 3,808,713 | 4,383,503 |
| Belgium | Ficus ..... | ..... | ..... | 462 |
| | Hevea ..... | ..... | ..... | 547,800 |
| Totals ..... | ..... | ..... | 548,262 | ..... |
| France | Hevea ..... | ..... | ..... | 6,600 |
| United States | Hevea | 28,600 | 539,000 | 162,800 |
| | Manihot (Ceara) ..... | ..... | 4,160 | ..... |
| Totals | 28,600 | 543,160 | 162,800 | 6,560,052 |
| Germany | Hevea ..... | ..... | ..... | 79,200 |

| | | | |
|-----------------------|---------|-----------|-----------|
| Castilloa | 2,735 | ..... | ..... |
| Totals | 81,935 | ..... | ..... |
| Singapore | 1,133 | 6,215 | 20,266 |
| Hevea | 8,800 | 129,800 | 739,200 |
| Manihot (Ceara) ..... | ..... | 5,702 | 260 |
| Castilloa | 1,811 | ..... | 9,002 |
| Totals | 11,744 | 141,717 | 768,468 |
| Australia ..... | ..... | ..... | 282 |
| Manihot (Ceara) ..... | ..... | ..... | 317 |
| Castilloa ..... | ..... | ..... | ..... |
| Totals ..... | ..... | ..... | 599 |
| Japan ..... | ..... | 26,400 | 244,200 |
| Other countries ..... | ..... | ..... | 2,202 |
| Hevea ..... | ..... | 17,600 | 140,800 |
| Totals ..... | ..... | 17,600 | 143,002 |
| Grand Total | 561,861 | 1,243,475 | 7,827,269 |
| GUTTA PERCHA, TO— | ..... | ..... | ..... |
| Singapore | 111,419 | 35,860 | 1,294,740 |
| GUTTA JELUTONG, TO— | ..... | ..... | ..... |
| Singapore ..... | ..... | ..... | 1,584 |
| Australia ..... | ..... | ..... | 24,200 |
| Totals ..... | ..... | ..... | 24,200 |

Crude Rubber Arrivals at the Port of New York

[The Figures Indicate Weights in Pounds.]

FEBRUARY 21.—By the steamer Gregory from Iquitos:

| | Fine. | Medium. | Coarse. | Caucho. | Total. |
|-----------------------------|---------|---------|---------|---------|---------|
| Meyer & Brown ..... | ..... | ..... | ..... | 28,600 | 28,600 |
| H. C. Kupper | 66,400 | ..... | 16,800 | 21,900 | 105,100 |
| Chartered Bank of Spanish | ..... | ..... | ..... | ..... | ..... |
| America | 19,300 | ..... | 5,100 | 39,800 | 64,200 |
| G. Amsinck & Co. | 7,700 | ..... | 4,600 | 17,600 | 29,900 |
| J. T. Johnstone & Co. | 13,300 | ..... | 5,000 | 1,400 | 19,700 |
| W. R. Grace & Co. | 1,300 | ..... | 5,800 | 10,200 | 17,300 |
| H. A. Astlett & Co. .... | ..... | ..... | 2,800 | 5,800 | 8,600 |
| Toledano Exporting Co. | 3,000 | ..... | 2,600 | 1,500 | 7,100 |
| Totals | 111,000 | ..... | 42,700 | 126,800 | 280,500 |

FEBRUARY 21.—By the steamer Gregory from Pará, Manáos:

| | | | | | |
|--------------------------|---------|--------|--------|--------|---------|
| Meyer & Brown | 41,800 | 2,700 | 77,300 | ..... | 121,800 |
| Robinson & Co. | 184,300 | 22,100 | 43,500 | 11,200 | 261,100 |
| Henderson & Korn | 25,700 | 14,600 | 25,000 | 25,600 | 90,900 |
| Arnold & Zeiss | 47,900 | 4,200 | 6,600 | ..... | 58,700 |
| H. A. Astlett & Co. | 6,600 | 1,100 | 47,300 | ..... | 55,000 |

| | Fine. | Medium. | Coarse. | Caucho. | Total. |
|-------------------------------|---------|---------|---------|---------|---------|
| G. Amsinck & Co. | 28,400 | 4,700 | 14,200 | 1,300 | 48,600 |
| Paul Bertuch | 10,000 | 1,100 | 22,600 | ..... | 33,700 |
| F. B. Ross Co. | 14,800 | 300 | 1,200 | 2,800 | 19,100 |
| Cowdrey & Co. | 200 | 400 | 3,500 | 600 | 4,700 |
| Alden's Successors, Ltd. .... | ..... | 11,300 | 6,900 | 11,660 | 29,860 |
| Totals | 359,700 | 62,500 | 248,100 | 53,160 | 723,460 |

MARCH 2.—By the steamer Acre from Pará:

| | | | | | |
|-------------------------------|---------|--------|---------|--------|---------|
| Meyer & Brown | 39,600 | 3,200 | 36,000 | ..... | 78,800 |
| Arnold & Zeiss | 84,100 | 23,300 | 69,500 | 13,800 | 190,700 |
| G. Amsinck & Co. | 68,000 | 4,100 | 22,800 | ..... | 94,900 |
| Alden's Successors, Ltd. .... | ..... | 6,250 | 21,880 | 28,300 | 56,430 |
| W. R. Grace & Co. | 22,600 | 700 | 2,700 | 4,400 | 30,400 |
| H. A. Astlett & Co. | 13,700 | 1,800 | 11,500 | 100 | 27,100 |
| General Rubber Co. .... | ..... | ..... | 24,000 | ..... | 24,000 |
| Paul Bertuch | 11,100 | ..... | ..... | ..... | 11,100 |
| Muller, Schall & Co. | 3,200 | ..... | 1,600 | 3,100 | 7,900 |
| Totals | 242,300 | 39,350 | 189,980 | 49,700 | 521,330 |

MARCH 3.—By the steamer Denis from Pará, Manáos:

| | | | | | |
|-------------------------------|---------|---------|---------|---------|-----------|
| Meyer & Brown | 113,500 | 20,900 | 91,400 | 50,400 | 276,200 |
| G. Amsinck & Co. | 203,700 | 27,500 | 79,900 | 4,000 | 315,100 |
| Henderson & Korn | 95,100 | 39,500 | 91,000 | 62,800 | 288,400 |
| General Rubber Co. | 188,300 | 2,700 | 54,000 | ..... | 245,000 |
| Arnold & Zeiss | 68,300 | 10,500 | 76,300 | 21,500 | 176,600 |
| Robinson & Co. | 147,200 | 4,400 | 11,900 | 3,200 | 166,700 |
| H. A. Astlett & Co. | 85,500 | 20,200 | 32,300 | 12,500 | 150,500 |
| Paul Bertuch | 59,500 | 800 | ..... | 31,900 | 92,200 |
| Alden's Successors, Ltd. | 3,800 | 9,870 | 8,100 | 55,200 | 76,970 |
| W. R. Grace & Co. | 23,800 | 5,100 | 6,500 | 23,800 | 59,200 |
| Pell & Dumont ..... | ..... | ..... | 10,600 | ..... | 10,600 |
| Cowdrey & Co. .... | ..... | ..... | 4,800 | 600 | 5,400 |
| Hagemeyer & Brunn | 1,900 | 100 | 1,300 | 100 | 3,400 |
| Totals | 990,600 | 141,570 | 468,100 | 266,000 | 1,866,270 |

MARCH 15.—By the steamer Atahualpa from Pará, Manáos:

| | | | | | |
|-------------------------------|---------|--------|---------|---------|-----------|
| Meyer & Brown | 1,900 | 800 | 2,500 | 56,100 | 61,300 |
| Arnold & Zeiss | 141,700 | 16,100 | 44,200 | 101,200 | 303,200 |
| Paul Bertuch | 230,500 | ..... | ..... | ..... | 230,500 |
| Robinson & Co. | 167,900 | 22,400 | 9,700 | 10,300 | 210,300 |
| Henderson & Korn | 74,700 | 3,800 | 45,900 | 81,900 | 206,300 |
| G. Amsinck & Co. | 92,400 | 11,900 | 23,100 | 52,500 | 181,900 |
| H. A. Astlett & Co. | 96,400 | 23,600 | 22,000 | 27,500 | 169,500 |
| W. R. Grace & Co. | 26,200 | 4,500 | 5,400 | ..... | 36,100 |
| Cowdrey & Co. | 5,700 | 1,500 | 1,900 | 1,900 | 11,000 |
| Alden's Successors, Ltd. | 1,500 | 6,150 | 1,180 | 80 | 8,910 |
| Totals | 838,900 | 90,750 | 157,880 | 331,480 | 1,419,010 |

| PARAS. | Pounds. |
|--|---------|
| FEBRUARY 28.—By the Ancon=Colon: | ..... |
| W. R. Grace & Co. (Fine) | 1,400 |
| FEBRUARY 28.—By the Byron=Rio de Janeiro: | ..... |
| Rubber & Guayule Agency, Inc. (Fine) | 3,000 |
| MARCH 2.—By the Colon=Colon: | ..... |
| G. Amsinck & Co. (Fine) | 9,500 |
| G. Amsinck & Co. (Caucho) | 11,000 |
| Gravenhorst & Co. (Fine) | 16,000 |
| Gravenhorst & Co. (Caucho) | 1,800 |
| MARCH 16.—By the Panama=Colon: | ..... |
| G. Amsinck & Co. (Fine) | 20,500 |
| G. Amsinck & Co. (Coarse) | 2,700 |
| Neus, Hessel & Co. (Fine) | 1,000 |
| Totals | 24,200 |

CENTRALS.

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

| | |
|--|--------|
| FEBRUARY 19.—By the Almirante=Cartagena: | ..... |
| Andean Trading Co. | 3,500 |
| Caballero & Blanco | 1,500 |
| Totals | 5,000 |
| FEBRUARY 21.—By the Tivies=Cortes: | ..... |
| Eggers & Heinlein | 600 |
| G. Amsinck & Co. | 100 |
| Totals | 700 |
| FEBRUARY 21.—By the Pastores=Port Limon: | ..... |
| Isaac Brandon & Bros. | 2,000 |
| A. A. Linde & Co. | 500 |
| C. E. Griffin | 800 |
| Totals | 3,300 |
| FEBRUARY 23.—By the Neches=Galveston: | ..... |
| Various | 33,500 |
| FEBRUARY 23.—By the Monterey=Mexico: | ..... |
| G. Schumann & Co. | 4,000 |
| G. Amsinck & Co. | 2,000 |
| Totals | 6,000 |
| FEBRUARY 24.—By the Alianca=Colon: | ..... |
| G. Amsinck & Co. | 32,400 |
| Lawrence Johnson & Co. | 16,800 |
| Pablo, Calvet & Co. | 12,000 |
| Muller, Schall & Co. | 3,000 |
| W. R. Grace & Co. | 2,400 |
| American Trading Co. | 2,400 |
| Dumarest Bros. | 900 |
| C. E. Griffin | 500 |
| Fidanque Bros. | 200 |
| J. R. Livermore | 200 |
| H. Mann & Co. | 600 |
| Commercial Bank Spanish Amer. | 200 |
| Gontard & Co. | 100 |
| Totals | 71,700 |

| | POUNDS. | |
|---|---------|---------|
| FEBRUARY 24.—By the <i>Zacapa</i> =Cartagena: | | |
| A. Held | 2,500 | |
| H. Wolff & Co. | 500 | 3,000 |
| FEBRUARY 28.—By the <i>Calumares</i> =Port Limon: | | |
| Suzarte & Whitney | 3,500 | |
| H. Marquardt & Co., Inc. | 200 | |
| United Fruit Co. | 1,000 | 4,700 |
| MARCH 2.—By the <i>Colon</i> =Colon: | | |
| G. Amsinck & Co. | 3,300 | |
| A. M. Capen's Sons | 4,500 | |
| Mecke & Co. | 4,200 | |
| Pablo, Calvet & Co. | 8,000 | |
| J. S. Sembrada & Co. | 1,700 | |
| Pottberg, Ebeling & Co. | 2,600 | |
| Piza, Nephews & Co. | 6,000 | 30,300 |
| MARCH 3.—By the <i>Carrillo</i> =Colombia: | | |
| G. Amsinck & Co. | 5,500 | |
| A. Held | 3,000 | |
| Andean Trading Co. | 2,000 | |
| Pottberg, Ebeling & Co. | 500 | 11,000 |
| MARCH 6.—By the <i>Esperanza</i> =Mexico: | | |
| Graham, Hinkley & Co. | 2,500 | |
| American Trading Co. | 4,000 | |
| G. Amsinck & Co. | 700 | |
| General Export & Commission Co. | 200 | |
| H. Marquardt & Co., Inc. | 300 | |
| J. A. Medina & Co. | 200 | |
| Thurston & Braidich | 400 | |
| VARIOUS | 5,000 | 13,500 |
| MARCH 7.—By the <i>Sirao</i> =Puerto Barrios: | | |
| W. R. Grace & Co. | 2,000 | |
| Rosenthal & Sons | 3,000 | 5,000 |
| MARCH 7.—By the <i>Tenadores</i> =Port Limon: | | |
| Isaac Brandon & Bros. | 3,000 | |
| G. Amsinck & Co. | 1,000 | |
| A. A. Linde & Co. | 1,000 | |
| H. Mann & Co. | 500 | 5,500 |
| MARCH 9.—By <i>El Mundo</i> =Galveston: | | |
| VARIOUS | | *22,500 |
| MARCH 10.—By the <i>Advance</i> =Colon: | | |
| Harburger & Stack | 700 | |
| G. Amsinck & Co. | 400 | |
| Pottberg, Ebeling & Co. | 200 | 1,300 |
| MARCH 14.—By the <i>Metapan</i> =Port Limon: | | |
| Isaac Brandon & Bros. | 1,500 | |
| United Fruit Co. | 1,200 | |
| Kunhardt & Co. | 500 | |
| C. E. Griffin | 500 | 3,700 |

| | POUNDS. | |
|---|---------|---------|
| MARCH 15.—By <i>El Sol</i> =Galveston: | | |
| Various | | *17,000 |
| MARCH 16.—By the <i>Panama</i> =Colon: | | |
| Gravenhorst & Co..... | 1,000 | |
| Andean Trading Co..... | 5,500 | |
| Muller, Schall & Co..... | 1,400 | 7,900 |
| MARCH 17.—By the <i>Camaguey</i> =Mexico: | | |
| Harburger & Stack..... | 3,000 | |
| H. Marquardt & Co., Inc..... | 200 | 3,200 |
| MARCH 17.—By the <i>Almirante</i> =Cartagena: | | |
| G. Amsinck & Co..... | 3,500 | |
| H. Wolff & Co..... | 3,500 | |
| Andean Trading Co..... | 2,500 | |
| Caballero & Blanco..... | 2,500 | 12,000 |
| MARCH 20.—By the <i>Cristobal</i> =Colon: | | |
| G. Amsinck & Co..... | 10,100 | |
| H. Mann & Co..... | 1,400 | |
| Harburger & Stack..... | 300 | |
| Gontard & Co..... | 700 | |
| Meyer Hecht | 300 | |
| Various | 400 | 13,200 |

AFRICANS.

| | |
|---|---------|
| FEBRUARY 19.—By the Ben Nevis=Havre: | ..... |
| Various | 67,000 |
| FEBRUARY 21.—By the Guyane=Bordeaux: | ..... |
| Various | 33,600 |
| FEBRUARY 21.—By the Finland=Liverpool: | ..... |
| Charles T. Wilson Co., Inc. | 45,000 |
| Edward Maurer Co., Inc. | 17,000 |
| Various | 6,000 |
| Totals | 68,000 |
| FEBRUARY 23.—By the New York=Liverpool: | ..... |
| Alden's Successors, Ltd. | 150,000 |
| FEBRUARY 26.—By the Roma=Lisbon: | ..... |
| W. H. Stiles | 22,500 |
| Edward Maurer Co., Inc. | 22,500 |
| S. R. Sequerra | 4,500 |
| Totals | 49,500 |
| FEBRUARY 29.—By the Californie=Havre: | ..... |
| Robert Badenhop Co. | 33,600 |
| MARCH 1.—By the Lepanto=Hull: | ..... |
| Alden's Successors, Ltd. | 22,500 |
| MARCH 3.—By the Atlas=Lisbon: | ..... |
| W. H. Stiles | 45,000 |

| POUNDS. | | POUNDS. | | POUNDS. | |
|--|---------|--|---------|--|------------|
| MARCH 6.—By the <i>Lord Drome</i> =Bordeaux: | | W. H. Stiles | | General Rubber Co. | |
| Various | 33,600 | MARCH 10.—By the <i>Anglo Bolivian</i> =London: | | Robert Badenhop Co., Inc. | 7,000 |
| MARCH 6.—By the <i>Framlington Court</i> =Havre: | | Meyer & Brown | 11,500 | H. R. Jeffords | 6,000 |
| Various | 11,200 | Rubber Trading Co. | 34,000 | Robinson & Co. | 11,200 |
| MARCH 6.—By the <i>Lapland</i> =Liverpool: | | Robinson & Co. | 50,000 | Rumsey & Greutert Co., Inc. | 2,200 |
| Earle Bros. | 4,500 | Robert Badenhop Co. | 112,000 | F. Stern & Co. | 40,000 |
| MARCH 6.—By the <i>Cymric</i> =Liverpool: | | Charles T. Wilson Co., Inc. | 80,000 | Hood Rubber Co. | 7,000 |
| Rubber Trading Co. | 11,000 | Raw Products Co. | 35,000 | Alden's Successors, Ltd. | 1,120 |
| Edward Maurer Co., Inc. | 7,000 | J. T. Johnstone & Co. | 65,000 | Fox & Co. | 110,000 |
| Robert Badenhop Co. | 11,200 | Arnold & Zeiss | 80,000 | J. T. Johnstone & Co. | 175,000 |
| MARCH 10.—By the <i>Chicago</i> =Bordeaux: | | Edward Maurer Co., Inc. | 47,000 | Goodyear Tire & Rubber Co. | 20,000 |
| Various | 33,600 | W. H. Stiles | 40,000 | Rubber Trading Co. | 58,000 |
| MARCH 13.—By the <i>Francisco</i> =Hull: | | MARCH 11.—By the <i>Launceston</i> =London: | | MARCH 20.—By the <i>Orduna</i> =Liverpool: | |
| General Rubber Co. | 40,000 | L. Littlejohn & Co. | 270,000 | The B. F. Goodrich Co. | 17,000 |
| Charles T. Wilson Co., Inc. | 33,500 | Goodyear Tire & Rubber Co. | 235,000 | Rubber Trading Co. | 4,000 |
| MARCH 15.—By the <i>Alston</i> =Havre: | | MARCH 11.—By the <i>Den of Airline</i> =London: | | CUSTOM HOUSE STATISTICS. | |
| Robert Badenhop Co. | 11,200 | Michelin Tire Co. | 50,000 | PORT OF NEW YORK—JANUARY, 1916. | |
| MARCH 16.—By the <i>Vandalia</i> =Liverpool: | | Robinson & Co. | 40,000 | Imports: | |
| Goodyear Tire & Rubber Co. | 11,200 | Arnold & Zeiss | 100,000 | India rubber | 19,452,793 |
| J. T. Johnstone & Co. | 15,000 | General Rubber Co. | 156,000 | Balata | 261,764 |
| Arnold & Zeiss | 60,000 | Charles T. Wilson Co., Inc. | 80,000 | Gutta percha | 136,936 |
| MARCH 15.—By the <i>Nias</i> =Batavia: | | Edward Maurer Co., Inc. | 115,000 | Gutta jelutong (Pontianak) .. | 1,333,876 |
| General Rubber Co. | 75,000 | W. H. Stiles | 15,000 | Rubber scrap imported | 640,336 |
| K. Schroeder | 40,000 | MARCH 13.—By the <i>City of Vienna</i> =Colombo: | | Totals | |
| Various | 18,000 | Meyer & Brown | 431,500 | Imports | 21,825,705 |
| MARCH 20.—By the <i>Celtic</i> =Liverpool: | | L. Littlejohn & Co. | 180,000 | Exports | 333,328 |
| Rubber Trading Co. | 11,200 | Goodyear Tire & Rubber Co. | 45,000 | Balata | 7,947 |
| MARCH 20.—By the <i>Quebra</i> =Liverpool: | | Henderson & Korn | 50,000 | Rubber scrap | 225,381 |
| J. T. Johnstone & Co. | 56,000 | J. T. Johnstone & Co. | 104,000 | Totals | |
| Robert Badenhop Co. | 22,500 | Robinson & Co. | 7,000 | Imports | 333,328 |
| Rubber Trading Co. | 13,500 | Edward Maurer Co., Inc. | 120,000 | PORT OF NEW ORLEANS—JANUARY, 1916. | |
| MARCH 20.—By the <i>Orduna</i> =Liverpool: | | Arnold & Zeiss | 156,000 | Imports: | |
| Goodyear Tire & Rubber Co. | 33,500 | W. R. Grace & Co. | 16,000 | India rubber | 29,109 |
| Robert Badenhop Co. | 28,000 | Various | 30,000 | PORT OF SAN FRANCISCO—JANUARY, 1916. | |
| Rubber Trading Co. | 5,600 | MARCH 13.—By the <i>Sibaira</i> =London: | | Imports: | |
| Arnold & Zeiss | 20,000 | Meyer & Brown | 22,500 | India rubber | 235,076 |
| Various | 6,700 | Goodyear Tire & Rubber Co. | 225,000 | Gutta percha | 22,471 |
| MANICOBIA. | | Rubber Trading Co. | 32,000 | Totals | |
| FEBRUARY 23.—By the <i>Stephen</i> =Ceara: | | L. Littlejohn & Co. | 135,000 | Imports | 257,547 |
| J. H. Rossbach & Bros. | 40,000 | Charles T. Wilson Co., Inc. | 120,000 | PORT OF BOSTON—FEBRUARY, 1916. | |
| FEBRUARY 23.—By the <i>Stephen</i> =Pernambuco: | | Robert Badenhop Co. | 50,000 | Imports: | |
| J. H. Rossbach & Bros. | 49,000 | Edward Maurer Co., Inc. | 50,000 | India rubber | 53,004 |
| Lawrence Johnson & Co. | 4,500 | W. H. Stiles | 19,000 | Gutta percha | 78,866 |
| PLANTATION RUBBER. | | MARCH 13.—By the <i>Pannonia</i> =London: | | Gutta jelutong (Pontianak) .. | 315,600 |
| FEBRUARY 19.—By the <i>Mongolia</i> =London: | | The B. F. Goodrich Co. | 170,000 | Manufactures of india rubber .. | 8,551 |
| Rubber Trading Co. | 2,000 | J. T. Johnstone & Co. | 92,000 | Rubber scrap | 8,250 |
| Goodyear Tire & Rubber Co. | 22,500 | Arnold & Zeiss | 45,000 | Totals | |
| Rumsey & Greutert Co., Inc. | 38,000 | Henderson & Korn | 11,200 | Imports | 455,720 |
| FEBRUARY 28.—By the <i>Merton Hall</i> =Colombo: | | Robinson & Co. | 4,500 | PORT OF CHICAGO—FEBRUARY, 1916. | |
| Meyer & Brown | 370,000 | MARCH 15.—By the <i>Nias</i> =Batavia: | | Imports: | |
| L. Littlejohn & Co. | 200,000 | Meyer & Brown | 130,000 | Manufactures of india rubber .. | \$800 |
| Edward Maurer Co., Inc. | 212,000 | General Rubber Co. | 140,000 | Rubber scrap | 48,546 |
| Goodyear Tire & Rubber Co. | 70,000 | Edward Maurer Co., Inc. | 165,000 | Totals | |
| Arnold & Zeiss | 55,000 | W. R. Grace & Co. | 40,000 | Imports | 48,546 |
| Henderson & Korn | 22,500 | G. Amineck & Co. | 60,000 | PORT OF CLEVELAND—FEBRUARY, 1916. | |
| J. T. Johnstone & Co. | 59,000 | Henderson & Korn | 17,000 | Imports: | |
| Various | 50,000 | J. T. Johnstone & Co. | 262,000 | India rubber | 659,337 |
| FEBRUARY 28.—By the <i>Korea</i> =London: | | Alden's Successors, Ltd. | 7,560 | PORT OF DETROIT—FEBRUARY, 1916. | |
| Rumsey & Greutert Co., Inc. | 11,200 | Manhattan Rubber Manufactur- | 15,000 | Imports: | |
| Various | 27,000 | ing Co. | 24,500 | Rubber scrap | 3,247 |
| FEBRUARY 29.—By the <i>Headley</i> =London: | | Rubber Trading Co. | 300,000 | PORT OF NEW ORLEANS—FEBRUARY, 1916. | |
| Meyer & Brown | 140,000 | Stein Hirsch Co. | 45,000 | Imports: | |
| General Rubber Co. | 235,000 | Arnold & Zeiss | 3,500 | India rubber | 292,847 |
| Raw Products Co. | 20,500 | L. Littlejohn & Co. | 117,000 | PORT OF NIAGARA FALLS—FEBRUARY, 1916. | |
| J. T. Johnstone & Co. | 57,000 | Various | 70,000 | Imports: | |
| Michelin Tire Co. | 100,000 | MARCH 16.—By the <i>Vandalia</i> =Liverpool: | | Manufactures of india rubber .. | \$148 |
| Arnold & Zeiss | 50,000 | Goodyear Tire & Rubber Co. | 27,000 | Rubber scrap | 61,821 |
| Rubber Trading Co. | 24,000 | MARCH 17.—By the <i>Calcutta</i> =Colombo: | | Totals | |
| Robinson & Co. | 45,000 | Meyer & Brown | 80,000 | Imports | 61,821 |
| L. Littlejohn & Co. | 190,000 | L. Littlejohn & Co. | 160,000 | EXPORTS. | |
| Charles T. Wilson Co., Inc. | 20,000 | Edward Maurer Co., Inc. | 45,000 | India rubber | 111,257 |
| Edward Maurer Co., Inc. | 95,000 | Arnold & Zeiss | 40,000 | Reclaimed rubber | 83,230 |
| W. H. Stiles | 60,000 | Goodyear Tire & Rubber Co. | 28,000 | Rubber scrap | 18,648 |
| Various | 15,000 | Rubber Trading Co. | 40,000 | Totals | |
| MARCH 1.—By the <i>Samland</i> =London: | | MARCH 20.—By the <i>Celtic</i> =Liverpool: | | Imports | 213,135 |
| Meyer & Brown | 12,000 | Rubber Trading Co. | 34,000 | PORT OF PHILADELPHIA—FEBRUARY, 1916. | |
| Goodyear Tire & Rubber Co. | 22,500 | MARCH 20.—By the <i>Quebra</i> =Liverpool: | | Exports: | |
| Charles T. Wilson Co., Inc. | 45,000 | Boston Insulated Wire & Cable | 3,500 | Rubber scrap | 34,586 |
| Edward Maurer Co., Inc. | 56,000 | Co. | 4,500 | Belting, hose, etc. | 1,738 |
| | | Standard Underground Cable Co. | 4,500 | All other manufactures of | |
| | | Rubber Trading Co. | 6,000 | india rubber | 6,373 |
| | | MARCH 20.—By the <i>Sumga</i> =Singapore: | | Totals | |
| | | Meyer & Brown | 16,000 | Imports | 34,586 |
| | | Henderson & Korn | 250,000 | Exports | \$2,680 |
| | | Arnold & Zeiss | 225,000 | | \$10,791 |
| | | L. Littlejohn & Co. | 785,000 | | |
| | | Edward Maurer Co., Inc. | 75,000 | | |

IMPORTS AND EXPORTS OF RUBBER AND RUBBER MANUFACTURES AT THE PORT OF NEW YORK.

| Week Ending— | India Rubber. | | Scrap for re-manufacture. | | Balata. | | Chicle. | | Gutta Percha. | |
|-------------------------|---------------|-----------|---------------------------|---------|---------|----------|---------|---------|---------------|--------|
| | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. | Pounds. | Value. |
| February 18, 1916. | 3,407,738 | \$5,146 | 88,910 | \$8,330 | 34,110 | \$11,314 | 13,322 | \$4,341 | ..... | \$459 |
| February 25, 1916. | 4,773,843 | 1,853,518 | 149,337 | 8,095 | 26,517 | 9,340 | 12,283 | 2,955 | ..... | 36 |
| March 3, 1916. | 5,698,470 | 3,583,505 | 479,237 | 35,105 | 152,051 | 56,390 | 36,450 | 23,362 | 14,454 | 3,087 |
| March 10, 1916. | 2,027,958 | 1,269,110 | 310,410 | 23,085 | 8,072 | 23,544 | 827 | 135 | ..... | ..... |

* Pounds not specified.

In addition to the above, the following imports of gutta jelutong are recorded: February 18, 1916, from Straits Settlements, 70,951 pounds, value \$3,655; February 25, 1916, from Straits Settlements, 42,010 pounds, value \$2,452.

EXPORTS.

FIGURES ISSUED FROM FEBRUARY 25, 1916, TO MARCH 25, 1916.

| EXPORTED TO— | Belting, Hose and Packing. | Footwear. | | Tires. | | Insulated Wire and Cable. | Other mnf. of India Rubber. | Fountain Pens. | Chewing Gum. | Reclaimed Rubber. | Scrap Rubber. |
|------------------------------|----------------------------------|-----------|----------|-----------|-----------|---------------------------------|-----------------------------------|-------------------|-----------------|----------------------|------------------|
| EUROPE: | | Boots. | Shoes. | Auto. | Other. | | | | | | |
| Denmark | \$323 | | \$354 | | \$1,725 | | \$260 | | | \$317 | |
| France | 4,384 | \$38 | 3,375 | \$6,516 | 43 | \$12,393 | 31,261 | \$50 | \$4,625 | 8,180 | \$1,310 |
| Gibraltar | | | | | | | | 211 | | | |
| Greece | | | | | | 430 | | | | | |
| Italy | | 1,136 | 3,917 | 63,436 | 11,438 | 10,605 | 16,836 | 313 | | 409 | |
| Netherlands | 802 | | 26 | 3,727 | 6,672 | 8,892 | 9,429 | | | | |
| Norway | 1,790 | | 197 | | 5,077 | 23,295 | 461 | | | 87 | |
| Portugal | 1,017 | 57 | | 1,754 | | 129 | 2,769 | 253 | | | |
| Russia in Europe | | | | 377,350 | | | 12,381 | | | | |
| Spain | | 160 | | | | 2,374 | 5,412 | | | | |
| Sweden | 32 | | | 11,028 | | | 7,501 | 305 | | | |
| Switzerland | | | | | | 855 | 2,395 | | | | |
| United Kingdom— | | | | | | | | | | | |
| England | 73,100 | 19,933 | 26,977 | 290,021 | 94,121 | 3,820 | 210,466 | 3,425 | 18,440 | 65,035 | 10,659 |
| Scotland | 1,920 | | 79 | 2,887 | | | 1,288 | | | 468 | 18,377 |
| Totals, Europe | \$83,388 | \$21,324 | \$34,925 | \$756,717 | \$119,076 | \$62,793 | \$320,459 | \$5,294 | \$23,065 | \$74,496 | \$30,346 |
| NORTH AMERICA: | | | | | | | | | | | |
| Bermuda | \$125 | | \$3 | | \$40 | \$1,274 | \$626 | \$64 | \$185 | | |
| British Honduras | 1 | | | | | | | | | \$34 | |
| Canada | | | | \$28 | | | 26 | | 120 | | |
| Central American States— | | | | | | | | | | | |
| Costa Rica | 740 | | 13 | 450 | 2 | 38 | 915 | 177 | 685 | | |
| Guatemala | | | | 305 | 52 | 327 | 256 | | 125 | | |
| Honduras | 28 | | | 666 | 301 | 3,589 | 144 | | 41 | 86 | |
| Nicaragua | 34 | | | 48 | | 513 | 1,519 | 219 | 47 | 30 | |
| Panama | 9,705 | \$853 | 1,297 | 4,580 | 1,085 | 2,679 | 2,183 | 254 | 1,320 | | |
| Salvador | 705 | | | 295 | 369 | 595 | 4,339 | | 435 | | |
| Mexico | 4,263 | | | 34,107 | 4,133 | 2,398 | 3,090 | 88 | | | |
| Newfoundland and Labrador... | 21 | 1,437 | 1,903 | | 93 | | 156 | 61 | 224 | | |
| West Indies— | | | | | | | | | | | |
| British— | | | | | | | | | | | |
| Barbados | 42 | | | 760 | | 28 | 187 | 53 | | | |
| Jamaica | 719 | | | 5,625 | 4,429 | 732 | 1,270 | | 24 | | |
| Trinidad and Tobago | 428 | | | 2,128 | 3,446 | 36 | 274 | | | | |
| Other British | 13 | | 25 | 210 | 129 | 38 | 170 | | | | |
| Cuba | 12,675 | | 36 | 50,311 | 10,655 | 18,369 | 25,736 | 5 | 748 | 3,230 | |
| Danish | | | 25 | | 5 | 4 | 41 | 3 | | 6 | |
| Dutch | 20 | | 11 | 727 | | 41 | 67 | | 28 | | |
| French | 36 | | 6 | 16 | | | 82 | 40 | | | |
| Haiti | 199 | | 32 | 83 | | | 245 | 84 | 12 | | |
| Santo Domingo | 314 | 17 | 21 | 457 | 589 | 133 | 748 | | | 15 | |
| Totals, North America... | \$30,088 | \$2,327 | \$3,309 | \$100,960 | \$25,427 | \$30,794 | \$42,074 | \$1,060 | \$4,021 | \$3,401 | |
| SOUTH AMERICA: | | | | | | | | | | | |
| Argentina | \$1,472 | | \$352 | \$89,507 | \$9,363 | \$12,800 | \$21,132 | \$1,427 | \$8,750 | \$374 | |
| Bolivia | 76 | | | 1,017 | | | 70 | | | 3 | |
| Brazil | 3,655 | \$69 | 464 | \$4,746 | 35,299 | 4,700 | 12,940 | 108 | | 385 | |
| Chile | 8,332 | | 1,532 | 4,087 | 3,093 | 6,295 | 5,084 | | | 5,477 | |
| Colombia | 250 | 34 | | 2,927 | 246 | 938 | 794 | 18 | 22 | | |
| Ecuador | 75 | | | 886 | | 66 | 487 | | | | |
| Guiana— | | | | | | | | | | | |
| British | | | | | | | | | | | |
| Dutch | | | | 30 | | | 218 | | | | |
| French | | | | | | | | 11 | | | |
| Peru | 2,325 | | 9 | 487 | 63 | 207 | 1,757 | | 11 | 38 | |
| Uruguay | 393 | | 1,813 | 15,253 | | 1,445 | 5,355 | | | | |
| Venezuela | 160 | | | 14,613 | 1,224 | 1,526 | 1,755 | 16 | | 24 | |
| Totals, South America... | \$16,738 | \$103 | \$4,170 | \$193,553 | \$49,534 | \$27,977 | \$49,635 | \$1,580 | \$8,783 | \$6,444 | |
| ASIA: | | | | | | | | | | | |
| China | \$607 | | | \$2,768 | \$100 | \$939 | \$705 | \$2 | | | |
| British East Indies— | | | | | | | | | | | |
| British India | 369 | | \$253 | 9,181 | 198 | 10,564 | 761 | 32 | \$88 | | |
| Dutch East Indies | 4 | | | 1,130 | | 1,548 | 148 | | | | |
| Hongkong | 222 | | | 2,503 | 6 | | 755 | | | | |
| Japan | 752 | | 118 | | | 1,200 | 766 | | | 1,331 | |
| Totals, Asia | \$1,954 | | \$371 | \$15,582 | \$304 | \$14,251 | \$3,135 | \$34 | \$88 | \$1,331 | |
| OCEANIA: | | | | | | | | | | | |
| British— | | | | | | | | | | | |
| Australia and Tasmania | \$2,178 | \$4,707 | \$11,254 | \$20,727 | \$4,155 | \$3,480 | \$10,628 | | \$3,778 | \$544 | |
| New Zealand | 520 | 3,279 | 5,584 | 97,485 | 4,213 | 66 | 7,537 | | 2,648 | 6 | |
| Philippine Islands | 7,183 | | | 6,749 | 1,503 | 1,039 | 1,981 | \$126 | 400 | | |
| Totals, Oceania | \$9,881 | \$7,986 | \$16,838 | \$124,961 | \$9,873 | \$4,585 | \$20,146 | \$126 | \$6,826 | \$550 | |
| AFRICA: | | | | | | | | | | | |
| British Africa— | | | | | | | | | | | |
| West | | | | \$2,621 | | | \$116 | | | | |
| South | \$57,879 | \$56 | \$1,098 | 73,702 | \$5,981 | \$105 | 8,257 | \$154 | \$67 | \$787 | |
| East | | | | 2,391 | | | | | | | |
| French Africa | | | | | 95 | | | | | | |
| Portuguese Africa | 329 | | | | | | 144 | | | | |
| Totals, Africa | \$58,208 | \$56 | \$1,098 | \$78,714 | \$6,076 | \$105 | \$8,517 | \$154 | \$67 | \$787 | |

In addition to the above the following items were exported during the same period: To England—Balata, \$49,274; to Newfoundland—Gutta Percha, \$25; to St. Pierre—Other Manufactures of India Rubber, \$16.

MONTHLY IMPORTATIONS OF RUBBER TO THE UNITED STATES FOR THE LAST SIX YEARS (IN TONS).

[From Annual Statistical Summary of Meyer & Brown, New York.]

| | Jan. | Feb. | March. | April. | May. | June. | July. | August. | Sept. | Oct. | Nov. | Dec. | Total. |
|---------------------------|-------|-------|--------|--------|-------|-------|-------|---------|-------|-------|-------|-------|--------|
| Fine Pará— | | | | | | | | | | | | | |
| 1910..... | 1,348 | 1,422 | 2,319 | 423 | 207 | 182 | 361 | 366 | 524 | 858 | 1,117 | 1,147 | 10,274 |
| 1911..... | 896 | 701 | 638 | 382 | 498 | 1,105 | 795 | 754 | 925 | 1,498 | 1,376 | 1,250 | 10,818 |
| 1912..... | 1,728 | 1,657 | 1,304 | 1,240 | 676 | 767 | 701 | 844 | 866 | 1,056 | 1,105 | 1,241 | 13,185 |
| 1913..... | 1,334 | 1,380 | 899 | 749 | 499 | 665 | 452 | 565 | 757 | 877 | 1,120 | 774 | 10,072 |
| 1914..... | 907 | 623 | 1,282 | 784 | 862 | 525 | 469 | 610 | 963 | 1,146 | 1,100 | 836 | 10,107 |
| 1915..... | 1,521 | 638 | 1,799 | 418 | 807 | 393 | 624 | 458 | 1,243 | 781 | 1,372 | 1,604 | 11,658 |
| Coarse Pará— | | | | | | | | | | | | | |
| 1910..... | 657 | 504 | 842 | 150 | 123 | 196 | 276 | 281 | 458 | 386 | 363 | 386 | 4,622 |
| 1911..... | 459 | 469 | 384 | 326 | 413 | 436 | 370 | 421 | 432 | 421 | 499 | 444 | 5,074 |
| 1912..... | 657 | 641 | 756 | 516 | 458 | 537 | 375 | 469 | 427 | 356 | 469 | 415 | 6,056 |
| 1913..... | 606 | 665 | 456 | 428 | 406 | 403 | 437 | 404 | 301 | 270 | 468 | 413 | 5,257 |
| 1914..... | 492 | 341 | 754 | 432 | 599 | 304 | 420 | 182 | 364 | 362 | 418 | 485 | 5,153 |
| 1915..... | 432 | 452 | 1,047 | 320 | 598 | 340 | 488 | 204 | 430 | 421 | 725 | 562 | 6,018 |
| Caucho— | | | | | | | | | | | | | |
| 1910..... | 228 | 291 | 370 | 109 | 21 | 38 | 245 | 234 | 197 | 55 | 62 | 43 | 1,893 |
| 1911..... | 52 | 241 | 120 | 183 | 259 | 143 | 236 | 193 | 91 | 115 | 104 | 88 | 1,825 |
| 1912..... | 85 | 333 | 15 | 391 | 359 | 306 | 130 | 213 | 183 | 213 | 221 | 327 | 2,776 |
| 1913..... | 226 | 250 | 185 | 280 | 383 | 491 | 398 | 231 | 258 | 140 | 223 | 87 | 3,152 |
| 1914..... | 188 | 107 | 625 | 858 | 744 | 292 | 365 | 185 | 337 | 148 | 188 | 169 | 4,206 |
| 1915..... | 137 | 223 | 1,111 | 246 | 356 | 306 | 463 | 449 | 275 | 227 | 329 | 219 | 4,341 |
| Plantation Ceylon— | | | | | | | | | | | | | |
| 1910..... | 332 | 179 | 314 | 248 | 134 | 234 | 483 | 281 | 317 | 307 | 416 | 366 | 3,611 |
| 1911..... | 339 | 417 | 616 | 518 | 688 | 489 | 460 | 470 | 614 | 697 | 551 | 697 | 6,556 |
| 1912..... | 866 | 976 | 986 | 1,286 | 1,750 | 676 | 849 | 923 | 1,153 | 1,568 | 1,735 | 2,235 | 15,003 |
| 1913..... | 1,611 | 1,558 | 1,978 | 1,783 | 1,801 | 1,700 | 1,728 | 1,979 | 2,534 | 2,214 | 2,373 | 2,708 | 23,967 |
| 1914..... | 2,165 | 2,782 | 3,329 | 4,407 | 4,105 | 2,493 | 2,204 | 2,032 | 3,989 | 3,360 | 2,327 | 2,133 | 35,326 |
| 1915..... | 410 | 3,865 | 5,205 | 7,166 | 4,443 | 6,319 | 5,260 | 5,311 | 5,330 | 6,665 | 3,750 | 7,361 | 61,085 |
| Other Grades— | | | | | | | | | | | | | |
| 1910..... | 1,706 | 1,240 | 1,741 | 1,131 | 761 | 663 | 955 | 1,006 | 942 | 836 | 717 | 818 | 12,516 |
| 1911..... | 642 | 615 | 1,398 | 889 | 895 | 682 | 750 | 843 | 1,176 | 1,238 | 608 | 1,079 | 10,815 |
| 1912..... | 1,390 | 1,373 | 1,786 | 1,864 | 900 | 697 | 645 | 921 | 1,019 | 803 | 645 | 988 | 13,031 |
| 1913..... | 1,116 | 823 | 342 | 558 | 635 | 428 | 454 | 371 | 328 | 397 | 292 | 532 | 6,276 |
| 1914..... | 242 | 675 | 515 | 603 | 644 | 281 | 211 | 215 | 415 | 336 | 366 | 581 | 5,084 |
| 1915..... | 776 | 254 | 506 | 780 | 442 | 642 | 671 | 597 | 633 | 585 | 451 | 731 | 7,068 |

EXPORTS OF INDIA RUBBER FROM MANAOS DURING JANUARY, 1916.

| EXPORTERS. | NEW YORK. | | | | | EUROPE. | | | | | Grand Totals. |
|-----------------------------------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------------|
| | Fine. | Medium. | Coarse. | Caucho. | Totals. | Fine. | Medium. | Coarse. | Caucho. | Totals. | |
| Suter & Co.....kilos | 47,847 | 2,999 | 14,260 | 28,836 | 93,942 | 25,840 | 3,680 | ..... | 10,400 | 39,920 | 133,862 |
| Pralow & Co..... | 202,542 | 16,843 | 42,495 | 16,553 | 278,433 | 113,253 | 10,647 | 26,124 | 30,240 | 180,264 | 458,697 |
| General Rubber Co. of Brazil..... | 102,544 | 22,791 | 25,165 | 25,500 | 176,000 | 86,751 | 14,428 | 18,391 | 15,552 | 135,122 | 311,122 |
| Armazens Andresen..... | 103,275 | 5,536 | 21,240 | 20,321 | 150,372 | ..... | ..... | ..... | ..... | ..... | 150,372 |
| Adelbert H. Alden, Ltd..... | ..... | 14,699 | 20,315 | 5,291 | 40,305 | 88,738 | 72 | 18 | 13,682 | 102,510 | 142,815 |
| Tancredi Porto & Co..... | 23,239 | 12,713 | 16,865 | 10,233 | 63,050 | 38,969 | 7,837 | 827 | 7,793 | 85,426 | 118,476 |
| I. G. Aranjó..... | ..... | ..... | ..... | ..... | ..... | 86,720 | 5,600 | 4,550 | 2,980 | 99,850 | 99,850 |
| Coutinho & Co..... | 1,160 | 7,200 | 4,590 | 1,920 | 14,870 | 19,520 | ..... | ..... | ..... | 19,520 | 34,390 |
| Semper & Co..... | 14,437 | 379 | 4,983 | 1,096 | 20,895 | 6,046 | ..... | 40 | ..... | 6,086 | 26,981 |
| Amorim Irmaos..... | ..... | ..... | ..... | ..... | ..... | 17,920 | 1,920 | 1,400 | ..... | 21,240 | 21,240 |
| Motta & Co..... | 45 | ..... | ..... | 45 | 9,737 | 1,247 | 3,030 | 822 | 14,836 | 14,881 | 14,881 |
| Mesquita & Co..... | 6,080 | 1,280 | 1,680 | 1,050 | 10,090 | 540 | ..... | 752 | 68 | 1,360 | 11,450 |
| M. Lobo..... | 7,040 | 160 | 600 | 1,310 | 9,110 | ..... | ..... | ..... | ..... | ..... | 9,110 |
| Maxim Holdun..... | ..... | ..... | ..... | ..... | ..... | ..... | 47 | 246 | 7,787 | 8,866 | 8,866 |
| Nicolaus & Co..... | ..... | ..... | ..... | ..... | ..... | 5,920 | ..... | ..... | ..... | 5,920 | 7,900 |
| Sundries..... | 88 | 163 | 2,314 | 293 | 2,858 | 4,131 | 1,300 | 4,483 | 215 | 10,129 | 12,987 |
| Exports from Manáos..... | 508,297 | 85,403 | 155,527 | 112,723 | 861,950 | 504,871 | 46,778 | 59,861 | 89,539 | 701,049 | 1,562,999 |
| In transit, Iquitos..... | 52,846 | 25,008 | 21,252 | 35,419 | 134,525 | 38,951 | 11,796 | 15,244 | 34,164 | 100,155 | 234,680 |
| Totals..... | 561,143 | 110,411 | 176,779 | 148,142 | 996,475 | 543,822 | 58,574 | 75,105 | 123,703 | 801,204 | 1,797,679 |

(Compiled by Suter & Co., Manáos.)

EXPORTS OF INDIA RUBBER AND CAUCHO FROM PARA AND MANAOS DURING THE MONTH OF JANUARY, 1916.

| EXPORTERS. | NEW YORK. | | | | | EUROPE. | | | | | Grand Totals. |
|-----------------------------------|-----------|---------|---------|---------|-----------|---------|---------|---------|---------|---------|---------------|
| | Fine. | Medium. | Coarse. | Caucho. | Totals. | Fine. | Medium. | Coarse. | Caucho. | Totals. | |
| J. Marques.....kilos | 155,692 | 24,357 | 157,081 | 100,647 | 437,777 | ..... | ..... | ..... | 3,049 | 3,049 | 440,826 |
| Suter & Co..... | 97,072 | 20,171 | 62,734 | 37,240 | 217,217 | 28,132 | 5,136 | ..... | 31,268 | 248,485 | 248,485 |
| Adelbert H. Alden, Ltd..... | 75,551 | 14,549 | 9,439 | 1,243 | 100,782 | 28,425 | ..... | ..... | 28,425 | 129,207 | 129,207 |
| General Rubber Co. of Brazil..... | 129,069 | 13,710 | 83,940 | 106,446 | 333,165 | ..... | ..... | ..... | ..... | 333,165 | 333,165 |
| Pires Teixeira & Co..... | 25,789 | 2,731 | 42,492 | 13,897 | 84,909 | 15,300 | 850 | ..... | 16,150 | 101,059 | 101,059 |
| Zarges, Berringer & Co..... | 68,391 | 6,838 | 11,356 | 9,442 | 96,027 | ..... | ..... | ..... | ..... | 96,027 | 96,027 |
| Seligmann & Co..... | 6,406 | ..... | ..... | 9,498 | 15,904 | ..... | ..... | ..... | ..... | 15,904 | 15,904 |
| Suárez Hermanos & Co..... | 42,470 | ..... | 14,380 | 9,086 | 65,936 | 9,347 | ..... | ..... | 9,347 | 75,283 | 75,283 |
| Stowell Brothers..... | ..... | ..... | ..... | 10,150 | ..... | 5,487 | 394 | 2,218 | 3,749 | 11,848 | 11,848 |
| G. Fradelizi & Co..... | 7,990 | 510 | 4,620 | ..... | 23,270 | 19,780 | 2,069 | 2,329 | 528 | 24,706 | 47,976 |
| Sundries..... | 76,098 | 4,759 | 58,340 | 32,712 | 171,839 | 20,504 | 3,243 | 5,412 | 1,260 | 30,419 | 202,258 |
| Exports from Pará..... | 684,458 | 87,625 | 444,382 | 330,361 | 1,546,826 | 126,975 | 9,692 | 9,959 | 8,586 | 155,212 | 1,702,038 |
| Exports from Manáos..... | 353,899 | 59,171 | 114,613 | 96,241 | 623,924 | 235,441 | 24,258 | 28,882 | 31,638 | 320,219 | 944,143 |
| Totals..... | 1,038,357 | 146,796 | 558,995 | 426,602 | 2,170,750 | 362,416 | 33,950 | 38,841 | 40,224 | 475,431 | 2,646,181 |

(Compiled by J. Marques, Pará.)

UNITED STATES RUBBER STATISTICS FOR 1915.

| ARTICLES. | IMPORTS. | | Totals, 1915. | |
|---|-----------------|--------------|---------------|---------------|
| | December, 1915. | | Pounds. | |
| | Pounds. | Value. | Pounds. | Value. |
| UNMANUFACTURED—(free): | | | | |
| Balata | 257,298 | \$93,747 | 2,302,684 | \$864,694 |
| Guayule gum | 64,173 | 88,916 | 4,966,464 | 1,445,453 |
| Gutta jelutong | 2,506,960 | 104,338 | 21,230,028 | 979,786 |
| Gutta percha | 214,763 | 21,129 | 2,231,246 | 258,948 |
| Totals | 3,043,194 | \$308,130 | 30,730,422 | \$3,548,881 |
| India rubber: | | | | |
| From France | 19,854 | \$10,887 | 290,446 | \$134,073 |
| Germany | | | 6,987 | 843 |
| Portugal | 285,903 | 88,096 | 4,351,835 | 1,539,939 |
| United Kingdom | 7,124,800 | 4,418,718 | 87,244,979 | 47,566,344 |
| Central America and British Honduras .. | 107,616 | 44,392 | 1,243,476 | 549,101 |
| Mexico | 137,517 | 47,936 | 1,761,911 | 660,648 |
| Brazil | 4,807,736 | 2,069,467 | 51,473,477 | 21,422,230 |
| Other South America .. | 308,121 | 127,705 | 5,949,524 | 2,519,091 |
| East Indies | 11,342,768 | 6,038,524 | 63,940,104 | 33,712,497 |
| Other countries | 155,225 | 96,058 | 5,219,182 | 2,926,378 |
| Totals | 24,289,540 | \$12,941,783 | 221,481,921 | \$111,031,144 |
| Rubber scrap | 1,249,707 | \$90,702 | 12,342,117 | \$877,026 |
| Totals, unmanufactured .. | | \$13,340,615 | | \$115,457,051 |
| Chicle | 503,350 | \$182,222 | 7,916,893 | \$2,903,018 |
| MANUFACTURED—(dutyable): | | | | |
| Gutta percha | | \$154 | | \$6,266 |
| India rubber | | 24,496 | | 445,253 |
| Totals, manufactured .. | | \$24,650 | | \$451,521 |
| Substitutes—elasticon, etc.. | | \$2,702 | | \$19,334 |

EXPORTS—DOMESTIC MERCHANDISE.

| | | | | |
|------------------------------|---------|-------------|-----------|--------------|
| Scrap and old rubber | 291,647 | \$42,788 | 3,117,750 | \$356,350 |
| Reclaimed rubber | 516,296 | 70,352 | 6,195,164 | 830,863 |
| Belting, hose and packing .. | | 207,904 | | 2,012,556 |
| Rubber boots | | 264,904 | | 1,228,681 |
| Rubber shoes | 146,712 | 77,484 | 2,098,531 | 1,475,697 |
| Automobile tires: | | | | |
| To England | | 835,299 | | 6,698,584 |
| Canada | | 81,084 | | 1,185,930 |
| Mexico | | 19,115 | | 152,578 |
| Cuba | | 61,617 | | 356,903 |
| Australia | | 94,646 | | 563,639 |
| Philippine Islands | | 26,002 | | 292,735 |
| Other countries | | 483,927 | | 2,165,329 |
| Totals | | \$1,601,690 | | \$11,415,698 |
| All other tires | | \$173,772 | | \$1,995,319 |
| Fountain pens | 10,063 | 7,115 | 200,261 | 205,040 |
| Other rubber goods | | 483,747 | | \$1,009,959 |
| Totals, manufactured .. | | \$2,929,756 | | \$24,621,163 |

EXPORTS—FOREIGN MERCHANDISE.

| | | | | |
|------------------------------|---------|----------|-----------|-------------|
| UNMANUFACTURED— | | | | |
| Balata | | 784,360 | | \$307,479 |
| Guayule gum | | 47,391 | | 16,701 |
| Gutta jelutong | | 2,773 | | 305 |
| Gutta percha | 13,645 | \$1,600 | 63,637 | 12,466 |
| India rubber | 155,956 | 95,831 | 4,664,095 | 2,357,350 |
| Scrap and refuse | | | 12,687 | 1,107 |
| Totals unmanufactured .. | | \$97,431 | | \$2,695,408 |
| Chicle | 9,446 | \$5,434 | 463,589 | \$156,285 |
| MANUFACTURED— | | | | |
| Gutta percha | | | | \$185 |
| India rubber | | | | 10,708 |
| Totals, manufactured .. | | | | \$10,893 |
| Substitutes—elasticon, etc.. | | | | \$364 |

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

| | | | | |
|------------------------------|-------|----------|--------|-----------|
| To Alaska: | | | | |
| Belting, hose and packing .. | | \$13,103 | | \$123,745 |
| Boots and shoes | 5,416 | 10,502 | 65,103 | 183,347 |
| Other rubber goods | | 1,729 | | 26,377 |
| Totals | | \$25,334 | | \$333,469 |
| To Hawaii: | | | | |
| Belting, hose and packing .. | | \$11,555 | | \$78,087 |
| Automobile tires | | 43,097 | | 447,469 |
| Other tires | | 7,973 | | 58,368 |
| Other rubber goods | | 7,702 | | 70,096 |
| Totals | | \$70,327 | | \$654,020 |

| ARTICLES. | December, 1915. | | Totals, 1915. | |
|------------------------------|-----------------|----------|---------------|-----------|
| | Pounds. | | Pounds. | |
| | Pounds. | Value. | Pounds. | Value. |
| To Philippine Islands: | | | | |
| Belting, hose and packing .. | | \$2,505 | | \$50,765 |
| Boots and shoes | 984 | 854 | 37,412 | 34,489 |
| Tires | | 3,726 | | 363,657 |
| Other rubber goods | | 29,552 | | 151,799 |
| Totals | | \$36,637 | | \$600,710 |
| To Porto Rico: | | | | |
| Belting, hose and packing .. | | \$3,551 | | \$34,676 |
| Automobile tires | | 32,799 | | 313,429 |
| Other tires | | 9 | | 27,326 |
| Other rubber goods | | 5,562 | | 66,097 |
| Totals | | \$41,921 | | \$441,528 |

UNITED KINGDOM RUBBER STATISTICS FOR MONTH ENDING FEBRUARY 29, 1916.

| ARTICLES. | February, 1916. | | Two Months Ending February 29, 1916. | |
|--|-----------------|-------------|--------------------------------------|--------------|
| | Pounds. | | Pounds. | |
| | Pounds. | Value. | Pounds. | Value. |
| UNMANUFACTURED— | | | | |
| Crude rubber: | | | | |
| From Dutch East Indies .. | 441,600 | \$324,065 | 1,014,600 | \$758,933 |
| French West Africa | 49,000 | 24,873 | 187,000 | 98,332 |
| Gold Coast | 100,500 | 40,377 | 178,800 | 71,807 |
| Other countries in Africa .. | 855,900 | 459,873 | 1,382,800 | 709,118 |
| Peru | 272,800 | 193,263 | 554,300 | 393,961 |
| Brazil | 2,383,600 | 1,681,720 | 4,176,200 | 3,108,976 |
| British India | 124,700 | 84,608 | 652,500 | 521,604 |
| Straits Settlements, including Labuan .. | 3,263,700 | 2,395,849 | 8,325,200 | 6,358,197 |
| Federated Malay States | 1,096,600 | 826,705 | 4,231,200 | 3,289,510 |
| Ceylon and dependencies .. | 1,573,800 | 1,222,484 | 4,015,200 | 3,156,215 |
| Other countries | 125,200 | 84,831 | 349,400 | 256,895 |
| Totals | 10,287,400 | \$7,338,648 | 25,067,200 | \$18,723,548 |
| Waste and reclaimed rubber .. | 600,100 | \$56,682 | 1,209,900 | \$138,515 |
| Gutta percha | 556,600 | 254,513 | 1,324,000 | \$460,655 |
| MANUFACTURED— | | | | |
| Apparel, waterproofed | | \$2,221 | | \$8,938 |
| Boots and shoes—dozen pairs .. | 24,284 | 185,467 | 43,286 | 400,814 |
| Insulated wire | | 73,736 | | 86,975 |
| Submarine cables | | | | 30,292 |
| Automobile tires and tubes .. | | 1,093,758 | | 2,513,354 |
| Motorcycle tires and tubes .. | | 21,938 | | 65,527 |
| Cycle tires and tubes | | 21,797 | | 108,359 |
| Tires not specified | | 8,918 | | 12,306 |

EXPORTS.

| ARTICLES. | February, 1916. | | Two Months Ending February 29, 1916. | |
|--------------------------------|-----------------|-----------|--------------------------------------|-----------|
| | Pounds. | | Pounds. | |
| | Pounds. | Value. | Pounds. | Value. |
| MANUFACTURED— | | | | |
| Apparel, waterproofed: | | | | |
| To France | | \$29,466 | | \$65,318 |
| British South Africa | | 10,362 | | 20,908 |
| British East Indies | | 3,154 | | 6,614 |
| Australia | | 33,344 | | 55,010 |
| New Zealand | | 15,197 | | 45,577 |
| Canada | | 13,020 | | 24,334 |
| Other countries | | 67,583 | | 132,051 |
| Totals | | \$172,126 | | \$349,812 |
| Boots and shoes—dozen pairs .. | 4,919 | \$28,431 | 14,646 | \$75,889 |
| Insulated wire | | 154,713 | | 342,858 |
| Submarine cables | | 31,920 | | 125,359 |
| Automobile tires and tubes .. | | 379,435 | | 762,631 |
| Motorcycle tires and tubes .. | | 35,711 | | 60,517 |
| Cycle tires and tubes | | 229,071 | | 492,843 |
| Tires not specified | | 75,578 | | 134,870 |
| Manufactures not specified .. | | 438,328 | | 1,059,864 |

EXPORTS—FOREIGN AND COLONIAL.

| ARTICLES. | February, 1916. | | Two Months Ending February 29, 1916. | |
|--------------------------------|-----------------|-------------|--------------------------------------|--------------|
| | Pounds. | | Pounds. | |
| | Pounds. | Value. | Pounds. | Value. |
| UNMANUFACTURED— | | | | |
| Crude rubber: | | | | |
| To Russia | 1,027,600 | \$582,801 | 1,532,100 | \$948,155 |
| France | 1,893,900 | 1,555,730 | 3,433,200 | 2,701,319 |
| United States | 5,666,900 | 4,177,262 | 10,540,100 | 7,708,038 |
| Other countries | 1,333,000 | 909,350 | 3,013,300 | 2,037,346 |
| Totals | 9,921,400 | \$7,225,143 | 18,518,700 | \$13,394,858 |
| Waste and reclaimed rubber .. | 33,900 | \$5,832 | 58,600 | \$9,905 |
| Gutta percha | 67,800 | 43,351 | 119,200 | 72,983 |
| MANUFACTURED— | | | | |
| Apparel, waterproofed | | \$39 | | \$102 |
| Boots and shoes—dozen pairs .. | 1,977 | 12,675 | 6,842 | 40,126 |
| Insulated wire | | 11,299 | | 16,393 |
| Automobile tires and tubes .. | | 312,794 | | 677,562 |
| Motorcycle tires and tubes .. | | 5,205 | | 7,071 |
| Cycle tires and tubes | | 52,094 | | 55,151 |
| Tires not specified | | 126 | | 977 |

RUBBER STATISTICS FOR CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

| UNMANUFACTURED, FREE— | December, 1915. | | Nine Months Ending December, 1915. | |
|---|------------------------|-----------------------------|------------------------------------|-----------------------------|
| | Pounds. | Value. | Pounds. | Value. |
| Rubber and gutta percha, crude caoutchouc or india rubber: | | | | |
| From Great Britain | 364,446 | \$215,462 | 3,692,965 | \$1,986,775 |
| United States | 186,571 | 110,774 | 2,998,768 | 1,511,643 |
| Brit. Straits Settlements | | | 22,574 | 11,659 |
| Other countries | | | 196,778 | 93,579 |
| Totals | 551,017 | \$326,236 | 6,911,085 | \$3,603,656 |
| Rubber, re-covered: | | | | |
| From Great Britain | | | 4,392 | \$2,482 |
| United States | 298,720 | \$40,958 | 3,371,971 | 426,005 |
| Totals | 298,720 | \$40,958 | 3,376,363 | \$428,487 |
| Hard rubber, in sheets and rods: | | | | |
| From Great Britain | 2,240 | \$1,335 | 2,244 | \$1,340 |
| United States | 32,932 | 3,480 | 126,603 | 14,467 |
| Totals | 35,172 | \$4,815 | 128,847 | \$15,807 |
| Rubber substitute: | | | | |
| From Great Britain | | | 16,644 | \$1,812 |
| United States | 90,708 | \$9,279 | 389,776 | 31,134 |
| Totals | 90,708 | \$9,279 | 406,420 | \$32,946 |
| Rubber, powdered, and rubber or gutta percha waste: | | | | |
| From Great Britain | | | 7,314 | \$579 |
| United States | 23,654 | \$2,172 | 860,704 | 53,388 |
| Other countries | | | 12,394 | 534 |
| Totals | 23,654 | \$2,172 | 880,412 | \$54,501 |
| Rubber thread, not covered: | | | | |
| From United States | 3,854 | \$5,261 | 23,316 | \$31,912 |
| Balata, crude: | | | | |
| From United States | | | 1,644 | \$991 |
| Chicle, crude: | | | | |
| From Great Britain | | | 2,888 | \$1,675 |
| United States | 48,000 | \$17,800 | 230,971 | 89,557 |
| British Honduras | 45,989 | 16,951 | 832,997 | 306,573 |
| Mexico | 31,387 | 10,153 | 216,480 | 79,890 |
| Totals | 125,376 | \$44,904 | 1,283,336 | \$477,695 |
| MANUFACTURED, DUTABLE— | December, 1915. | | Nine Months Ending December, 1915. | |
| | General Tariff. Value. | Preferential Tariff. Value. | General Tariff. Value. | Preferential Tariff. Value. |
| Waterproof clothing: | | | | |
| From Great Britain | | \$9,440 | \$3,454 | \$274,885 |
| United States | \$5,118 | | 80,098 | |
| Other countries | 42 | | 63 | |
| Totals | \$5,160 | \$9,440 | \$83,615 | \$274,885 |
| Hose, lined with rubber: | | | | |
| From Great Britain | | \$31 | | \$420 |
| United States | \$4,145 | | \$54,074 | |
| Totals | \$4,145 | \$31 | \$54,074 | \$420 |
| Mats and matting: | | | | |
| From Great Britain | | \$36 | | \$131 |
| United States | \$83 | | \$1,013 | |
| Totals | \$83 | \$36 | \$1,013 | \$131 |
| Packing: | | | | |
| From Great Britain | | | \$110 | \$1,153 |
| United States | \$2,601 | | 36,793 | |
| Totals | \$2,601 | | \$36,903 | \$1,153 |
| Tires of rubber for all vehicles: | | | | |
| From Great Britain | \$4,110 | \$948 | \$14,102 | \$21,907 |
| United States | 51,575 | | 1,039,683 | |
| France | 818 | | 16,437 | |
| Other countries | 2 | | 1,132 | |
| Totals | \$56,505 | \$948 | \$1,071,354 | \$21,907 |
| *Rubber cement and all manufactures of india rubber and gutta percha, N. O. P.: | | | | |
| From Great Britain | \$117 | \$8,303 | \$2,385 | \$120,086 |
| United States | 47,939 | | 425,047 | |
| Other countries | 1 | | 688 | |
| Totals | \$48,057 | \$8,303 | \$428,120 | \$120,086 |
| Hard rubber in tubes: | | | | |
| From United States | \$292 | | \$2,913 | |
| Boots and shoes: | | | | |
| From Great Britain | | | | \$11,546 |
| United States | \$8,829 | | \$67,413 | |
| Other countries | | | 10 | |
| Totals | \$8,829 | | \$67,423 | \$11,546 |
| Belting: | | | | |
| From Great Britain | | | | \$1,053 |
| United States | \$4,194 | | \$39,127 | |
| Totals | \$4,194 | | \$39,127 | \$1,053 |

Webbing—over one inch wide:

| | | | | |
|--------------------------|----------|---------|-----------|----------|
| From Great Britain | \$25 | \$2,681 | \$67 | \$10,611 |
| United States | 23,583 | | 117,989 | |
| Other countries | | | 330 | |
| Totals | \$23,608 | \$2,681 | \$118,386 | \$10,611 |

*In addition, the imports of rubber cement and all manufactures of india rubber and gutta percha not otherwise provided for amounted to \$260 from various countries for December; and \$207 from Great Britain, and \$1,795 from other countries for the nine months ending December, 1915, the values being at treaty rates.

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

| MANUFACTURED, DUTABLE— | December, 1915. | | Nine Months Ending December, 1915. | |
|----------------------------|----------------------------|-------------------------------------|------------------------------------|-------------------------------------|
| | Prod-uce of Canada. Value. | Re-exports of foreign goods. Value. | Prod-uce of Canada. Value. | Re-exports of foreign goods. Value. |
| Belting: | | | | |
| To Great Britain | \$150 | | \$150 | |
| United States | | | 424 | \$58 |
| Newfoundland | | | 112 | |
| Other countries | | | 33 | |
| Totals | \$150 | | \$719 | \$58 |
| Hose: | | | | |
| To Great Britain | | | \$11,608 | |
| United States | \$132 | | 3,936 | \$201 |
| Newfoundland | | | 2,966 | |
| Other countries | 140 | | 1,900 | |
| Totals | \$272 | | \$20,410 | \$201 |
| Boots and shoes: | | | | |
| To Great Britain | \$158,923 | | \$417,308 | |
| United States | 5 | | 3,531 | \$492 |
| Newfoundland | 13,693 | | 69,759 | |
| Australia | 2,304 | | 24,317 | |
| Other countries | 4,026 | | 19,194 | \$27 |
| Totals | \$178,951 | | \$534,109 | \$819 |
| Mats and matting: | | | | |
| To various countries | \$15 | | \$433 | |
| Clothing: | | | | |
| To Great Britain | | | \$27 | \$10 |
| United States | | | 39 | 202 |
| Newfoundland | | | 140 | |
| Other countries | | | 62 | |
| Totals | | | \$268 | \$212 |
| *Rubber waste: | | | | |
| To United States | \$54,287 | | \$412,894 | \$1,964 |
| All other mnt., N. O. P.: | | | | |
| To Great Britain | \$113,088 | \$1,717 | \$639,684 | \$3,671 |
| United States | 7,435 | 5,594 | 95,802 | 275,118 |
| Newfoundland | 171 | | 4,797 | 785 |
| Australia | 1,612 | | 4,576 | |
| Other countries | 10,725 | | 77,274 | 10 |
| Totals | \$133,031 | \$7,311 | \$822,133 | \$279,584 |
| †Gum chicle: | | | | |
| To Great Britain | | | \$10,000 | |
| United States | \$52,500 | \$2,422 | \$20,203 | \$111,840 |
| Other countries | | | 42,216 | 1,107 |
| Totals | \$52,500 | \$2,422 | \$572,419 | \$112,947 |

*During December, 730,600 pounds of rubber waste was exported to United States, making a total of 6,628,100 pounds for the nine months ending December, 1915.

†During December, 109,414 pounds of gum chicle was exported to the United States. During the nine months ending December, 1915, 20,000 pounds of gum chicle was exported to Great Britain, 1,187,999 to the United States, and 66,834 pounds to other countries.

THE RUBBER SCRAP MARKET.

NEW YORK.

GENERALLY speaking, the rubber scrap market has been quiet during the past month, with firm prices ruling at practically the same levels of a month ago. Prices for boots and shoes early in the month had an easier tendency than the week before, and declined $\frac{1}{4}$ cent per pound. This, however, failed to interest the large buyers, although enough business was indulged in at 10 $\frac{3}{4}$ to 11 cents to support the market. Toward the end of the month trading of a fairly active nature resulted in considerable business being done at 11 cents and a shade under that price.

The month's transactions in mixed auto tires appeared to be confined to small sales, at prices around 6 $\frac{1}{2}$ cents. However, sales to the mills at 6 $\frac{1}{4}$ cents were reported later in the month. G. and G. tires have had some call at prices ranging from 8 $\frac{1}{4}$ to 9 cents, but the large buyers were not interested. Inner tubes continued to be a largely speculative feature and the price to the

mills of 30 to 31 cents for No. 1 tubes is nominal. Solid tires were unchanged.

The mechanical grades have gone very well with No. 1 white scrap leading at 13½ cents but the demand, which included black scrap, fell off toward the end of the month.

A new circular setting forth the changes in packing rubber scrap that were adopted recently by the rubber scrap division, can be obtained from Chairman Paul Loewenthal or from Secretary Haskins of the National Association of Waste Material Dealers.

United States imports of rubber scrap for the year ending December 31, 1915, were 12,342,117 pounds, value \$877,026. Exports of domestic scrap for the same period was 3,117,750 pounds, value \$356,350

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED. MARCH 30, 1916.

Prices subject to change without notice.

| | Per Pound. |
|---|---------------|
| Boots and shoes | \$0.10½ @ .11 |
| Trimmed arctics | .08½ @ .09½ |
| White tires, Goodrich and Goodyear | .08½ @ .09½ |
| Auto tires, standard white | .06½ @ .07 |
| standard mixed | .06½ @ .07 |
| stripped, unguaranteed | .04½ @ .05 |
| Auto peelings, No. 1 | .09½ @ .10½ |
| No. 2 | .09 @ .09½ |
| Inner tubes, No. 1 | .30 @ .31 |
| No. 2 | .13 @ .14 |
| red | .13½ @ .14 |
| Irony tires | .02½ @ .02½ |
| Bicycle tires | .04 @ .04½ |
| Solid tires | .05½ @ .06 |
| White scrap, No. 1 | .13½ @ .16 |
| No. 2 | .10 @ .13 |
| Red scrap, No. 1 | .10½ @ .11½ |
| No. 2 | .08 @ .10 |
| Mixed black scrap, No. 1 | .04½ @ .05½ |
| No. 2 | .04½ @ .04½ |
| Rubber car springs | .04½ @ .05½ |
| Horse shoe pads | .04½ @ .04½ |
| Matting and packings | .01 @ .01½ |
| Garden hose | .01½ @ .02 |
| Air brake hose | .06 @ .06½ |
| Cotton fire hose | .02½ @ .03½ |
| Large hose | .02 @ .02½ |
| Hard rubber scrap, No. 1, bright fracture | .26 @ .28 |
| Battery jars (black compound) | .03 @ .04 |
| Insulated wire stripping | .04 @ .04½ |
| Rubber heels | .03½ @ .04 |

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

THE market during March has maintained the same characteristics as that for February. The tendency, in most lines, to advance has become effective. Spot stocks of the principal materials are small and manufacturers dependent on them are paying almost prohibitive prices. Not many, however, are so situated, as there are probably none among the large buyers without the protection afforded by contracts.

LITHARGE.

An advance of 1½ cents per pound has taken place during March, based on the demand which advanced pig lead.

ZINC OXIDE.

The domestic supply is practically used up in filling contract orders, leaving very little surplus for new accounts. There are no fixed quotations for spot sales which are all in second hands.

New contract prices for French process zinc oxide for the second quarter-year took effect March 1. They are as follows in cents per pound: white seal 25@25½; green seal 24½@24½; red seal 24@24½.

LITHOPONE.

Lithopone is almost out of the market. Consumers not covered by contract are unable to obtain large amounts and are obliged to pay excessive prices to obtain any supply.

CAUSTIC SODA.

The output is heavily sold ahead and stocks are scarce. Prices are firm, but have not advanced materially over those ruling a month ago.

SULPHURIC ACID.

The production is believed to be increasing. Stocks are at very low level. There is no evidence of a weakening in prices.

PRICES OF CHEMICAL AND COMPOUNDING INGREDIENTS.

NEW-YORK, MARCH 30, 1916.

Subject to change without notice.

| | | | |
|--|------|---------|----------|
| Acetone (drums) | lb. | \$0.45 | @ \$0.46 |
| Acid, acetic, 28 per cent. (bbls.) | lb. | .09 | @ .10 |
| creosylic (crude) | gal. | .70 | @ .80 |
| glacial, 99% (carbonyl) | lb. | .50 | @ .50 |
| nitric, 36% | lb. | .02½ | @ .03½ |
| Alumina Pigment, No. 1 | ton | 15.00 | @ 17.00 |
| Aluminum Flake (carloads) | ton | 18.00 | @ 20.00 |
| Ammonium carbonate | lb. | .08½ | @ .09½ |
| Antimony, crimson, sulphuret of (casks) | lb. | 1.00 | @ |
| crimson, "Mephisto" (casks) | lb. | .85 | @ |
| golden, sulphuret of (casks) | lb. | 1.00 | @ |
| golden, sulphuret, States brand, 16-17% | lb. | .65 | @ |
| Asbestine | ton | 19.00 | @ 20.00 |
| Asbestos | lb. | .04 | @ .20 |
| Asphaltum, "C" Brilliant | lb. | .93 | @ .03½ |
| Barium sulphate, precipitated | ton | 130.00 | @ |
| Barites, pure white | ton | 18.00 | @ 21.00 |
| off color | ton | 15.00 | @ 16.00 |
| Basofor | ton | 125.00 | @ |
| Benzol, pure | gal. | .80 | @ .90 |
| Beta-Naphthol | lb. | 1.50 | @ 1.75 |
| Black Hypo | lb. | .39 | @ .40 |
| Bone ash | lb. | .10 | @ |
| black | lb. | .03½ | @ .07 |
| Cadmium tri-sulphate | lb. | None | @ |
| yellow | lb. | None | @ |
| Canella gum | lb. | .27½ | @ .35 |
| Carbon, bisulphide (drums) | lb. | .07½ | @ .09 |
| black (cases) | lb. | .10 | @ .12 |
| tetrachloride (drums) | lb. | .17 | @ .18 |
| Caustic soda, 76 per cent. (bbls.) | cwt. | 6.25 | @ |
| Chalk, precipitated, extra light | lb. | .04½ | @ .05½ |
| precipitated, heavy | lb. | .04 | @ |
| China clay, domestic | ton | 10.00 | @ 12.00 |
| imported | ton | 12.50 | @ 20.00 |
| Chrome, green | lb. | .17 | @ |
| yellow | lb. | .32 | @ |
| Coal tar | bbl. | 5.00 | @ |
| Corn oil, refined | lb. | .11 | @ |
| Cotton linters | lb. | .06½ | @ |
| Emarex | ton | 100.00 | @ |
| Gas black | lb. | .29 | @ |
| Gilsonite | ton | 37.50 | @ 42.50 |
| Glycerine, C. P. (drums) | lb. | .56 | @ .57 |
| Graphite, flake (400 pound bbl.) | lb. | .17½ | @ |
| Green oxide of chromium (casks) | lb. | .05 | @ .06 |
| Ground glass | lb. | .02½ | @ |
| Indian red, reduced grades | lb. | .03½ | @ .05 |
| pure | lb. | .07 | @ .08 |
| Infusorial earth, powdered | ton | 60.00 | @ |
| bolton | ton | 60.00 | @ |
| Iron oxide, red, reduced grades | lb. | .02½ | @ .06 |
| red, pure, bright | lb. | .07 | @ .15 |
| Hemingways | lb. | .05½ | @ .08½ |
| Lampblack | lb. | .10 | @ .24 |
| Lead, red | lb. | .11 | @ .15 |
| sublimed blue | lb. | .08½ | @ |
| white, basic carbonate | lb. | .08½ | @ |
| white, basic sulphate | lb. | .08½ | @ |
| Lime, flour | lb. | .01½ | @ .01½ |
| Litharge | lb. | .09½ | @ .11 |
| English | lb. | .14 | @ .15 |
| Lithopone, domestic | lb. | .14½ | @ .15½ |
| Imported | lb. | .11 | @ .16 |
| Magnesia, carbonate | lb. | .16 | @ .17 |
| calcined, heavy | lb. | .40 | @ .45 |
| light | lb. | .10 | @ |
| Magnesite, calcined, powdered | ton | 35.00 | @ 39.00 |
| Mica, powdered | lb. | .03½ | @ .05½ |
| Mineral rubber | lb. | .01½ | @ .03½ |
| Naphtha, stove gasoline (steel bbls.) | gal. | .24 | @ |
| 66@68 degrees | gal. | .28 | @ |
| 68@70 degrees | gal. | .29 | @ |
| V. M. & P. | gal. | .23 | @ |
| Oil, aniline | lb. | .90 | @ 1.00 |
| linseed (bbl.) | gal. | .77 | @ .81 |
| palm | gal. | .16 | @ .20 |
| paraffin | gal. | .17 | @ |
| pine (cases) | gal. | .65 | @ |
| rapeseed | gal. | 1.05 | @ 1.15 |
| rosin, heavy body | gal. | .32 | @ .36 |
| tar (cases) | gal. | .20 | @ |
| soluble aniline colors, yellow, orange, red, violet, blue, green | lb. | 3.50 | @ 5.00 |
| Orange mineral, domestic | lb. | 12½ | @ |
| Paragol | lb. | .11 | @ |
| Petrolatum | lb. | .04 | @ |
| Petroleum grease | lb. | .02½ | @ |
| Pine solvent | lb. | .04½ | @ |
| Pine tar, retort | gal. | .14 | @ |
| Pitch, burgundy | lb. | .04½ | @ .05½ |
| pine | lb. | .02½ | @ |
| Plaster of paris | lb. | 1.50 | @ 1.70 |
| Prussian blue | lb. | nominal | @ |
| Pumice stone, powdered (bbls.) | lb. | .02 | @ .03 |
| Resin, Pontianak, refined | lb. | .15 | @ |
| granulated | lb. | .12 | @ |
| fused | lb. | .10 | @ |
| Rosin (280 pound bbls.) | bbl. | 5.65 | @ |
| Rotten stone, powdered | lb. | .02½ | @ .04 |
| Rubber black | lb. | .04½ | @ |
| Rubber compound, Richmond brand | lb. | .03 | @ |
| No. 64 brand | ton | 35.00 | @ |
| Rubber substitute, black | lb. | .09 | @ .20 |
| white | lb. | .13½ | @ .18 |

| | | | | |
|---|------|---------|---|---------|
| Rubhide | lb. | .26 | ● | |
| Shellac, fine orange | lb. | .30 | ● | .32 |
| Soapstone, powdered | ton | 12.00 | ● | 15.00 |
| Starch, corn, powdered | lb. | .02 1/4 | ● | .02 1/2 |
| Sulphur chloride (drums) | lb. | .08 1/2 | ● | .09 |
| Sulphur, flowers | cwt. | 2.30 | ● | 2.60 |
| flour, velvet, Brooklyn brand | cwt. | 2.15 | ● | 2.60 |
| Sulphuric acid, 60° | lb. | .02 1/2 | ● | .02 1/4 |
| Talc, American | ton | 9.00 | ● | 13.00 |
| French | ton | 5.00 | ● | 12.00 |
| Toluol, pure | gal. | 4.75 | ● | 5.00 |
| Tripolite earth, powdered | ton | 50.00 | ● | |
| bolted | ton | 60.00 | ● | |
| Turpentine, pure gum spirits | gal. | .54 | ● | |
| wood | gal. | .48 | ● | |
| (Venice) | gal. | .11 1/2 | ● | |
| Ultramarine blue | lb. | nominal | ● | |
| Vermilion, brilliant | lb. | None | ● | |
| Chinese | lb. | 2.00 | ● | 2.25 |
| English | lb. | 2.75 | ● | 3.00 |
| Wax, bayberry | lb. | .22 | ● | .24 |
| beeswax, white | lb. | .46 | ● | .50 |
| ceresin, white | lb. | .14 | ● | .16 |
| carnauba | lb. | .26 | ● | .40 |
| ozokerite, black | lb. | .50 | ● | .65 |
| green | lb. | .65 | ● | .85 |
| montan | lb. | .30 | ● | .32 |
| paraffin, refined, 118/120 m. p. (cases) | lb. | .05 1/2 | ● | |
| 123/125 m. p. (cases) | lb. | .06 | ● | |
| 128/130 m. p. (cases) | lb. | .06 1/2 | ● | |
| 133/136 m. p. (cases) | lb. | .07 1/2 | ● | |
| crude, white, 117/119 m. p. (bbls.) | lb. | .04 1/2 | ● | |
| yellow, 124/126 m. p. (bbls.) | lb. | .04 1/2 | ● | |
| Whiting, Alba | cwt. | .50 | ● | .60 |
| commercial | cwt. | .60 | ● | .75 |
| gilders | cwt. | .70 | ● | .80 |
| Paris, white, American | cwt. | .80 | ● | .90 |
| English clifstone | cwt. | .90 | ● | 1.50 |
| Wood pulp, XXX | cwt. | .23 | ● | .28 |
| Yellow ochre | lb. | .02 1/2 | ● | .06 |
| Zinc oxide, American process, horsehead brand | lb. | .09 1/2 | ● | .10 |
| "special" | lb. | .08 1/2 | ● | .09 1/4 |
| "XX red" | lb. | .24 1/2 | ● | .24 1/4 |
| French process, green seal, f. o. b. factory | lb. | .24 | ● | .24 1/2 |
| red seal, f. o. b. factory | lb. | .25 | ● | .25 1/2 |
| white seal, f. o. b. factory | lb. | .28 | ● | |
| Zinc oxide, imported, white seal | lb. | None | ● | |
| Zinc sulphide, pure | lb. | None | ● | |

MARKET FOR COTTON AND OTHER FABRICS.

EGYPTIAN COTTON.

MAIL advices from Alexandria, dated February 15, state that the market has advanced steadily, recording the highest prices since 1910-1911. F. G. F. Sakelarides has brought from 28 1/4 to 28 3/4. The continued demand for spot cotton and the high prices obtaining appear to be the primary causes of this recent advance. The insufficiency of the crop is already being felt, resulting in a bullish speculative market that may continue to support the present high prices during the coming month. However, later in the week the appearance on the market of about 50,000 bales served as a check to the speculators.

SEA ISLAND COTTON.

The bulk of unsold cotton is said to be held by exporters and interior dealers who are holding for higher prices. All the lower grades have been sold and now the better sorts are in demand. During the last week of the month Islands extra fine was firmly held at 34 cents landed. The market for Florida and Georgia was very steady with hardening prices and limited offerings. The last sales reported were on a basis of 32 3/4 cents for Fancy landed.

FABRICS.

The fundamental reasons that now influence the general conditions of the fabric market are equally reflected in tire fabrics, hose and belting, duck, yarn, dyed goods and cotton raincoat cloth. In fact, the great demand continues to engage the energetic efforts of the producers in meeting contract obligations promptly and handling the large volume of new business.

Fabric mills have sold their production for a year ahead and new contracts are now being written with a war clause, covering the uncertainty of raw cotton shipments. The freight congestion has increased the difficulties of obtaining raw material and general mill supplies. The same cause in many instances

has resulted in factory shipments being delayed, causing the consignees serious loss. Fabric mills that are located near munition plants are unable to keep a full complement of labor on account of the high wages offered by the manufacturers of war materials. Moreover, strikes and labor differences continue to beset the manufacturers of fabrics.

It is therefore not at all surprising that prices have advanced throughout the entire list with small prospect of lower values for the immediate future, at least.

The following are New York quotations on March 30, 1916:
(Subject to change without notice.)

Aeroplane and Balloon Fabrics:

| | | | |
|--|------|---------|---|
| Wamsutta, S. A. I. L. No. 1, 40-inch | yard | \$0.22 | ● |
| No. 4, 38 1/2-inch | | .22 | ● |
| O/X B. 36-inch | | .12 1/4 | ● |

Wool Stockinettes—52-inch:

| | | | |
|------------------|------|----------|---|
| A—14-ounce | yard | 1.12 1/2 | ● |
| B—14-ounce | | 1.25 | ● |
| C—14-ounce | | 1.50 | ● |

Cotton Stockinettes—52-inch:

| | | | | |
|----------------------|------|---------|---|---------|
| D—14-ounce | yard | .49 | ● | .50 |
| E—11 1/2-ounce | | .39 | ● | .40 |
| F—14-ounce | | .53 | ● | .54 |
| G—8-ounce | | .43 | ● | .44 |
| H—11-ounce | | .48 | ● | .49 |
| I—9-ounce | | .40 1/2 | ● | .41 1/2 |

Colors—white, black, blue, brown.

Tire Fabrics:

| | | | | |
|---------------------------------------|-------------|-----|---|-----|
| 17 1/2-ounce Sea Island, combed | square yard | .75 | ● | .78 |
| 17 1/2-ounce Egyptian, combed | | .70 | ● | |
| 17 1/2-ounce Egyptian, carded | | .67 | ● | |
| 17 1/2-ounce Peellers, carded | | .46 | ● | |

Sheeting:

| | | | |
|-------------------------|------|---------|--|
| 40-inch 2.35-yard | yard | nominal | |
| 40-inch 2.50-yard | | nominal | |
| 40-inch 2.70-yard | | nominal | |
| 40-inch 2.85-yard | | nominal | |
| 40-inch 3.15-yard | | nominal | |

Osnaburgs:

| | | | |
|----------------------------|------|---------|--|
| 40-inch 2.25-yard | yard | nominal | |
| 40-inch 2.48-yard | | nominal | |
| 37 1/2-in. 2.42-yard | | nominal | |

Mechanical Ducks:

| | | | | |
|---------------|------|-----|---|---------|
| Hose | pond | .27 | ● | .28 1/2 |
| Belting | | .27 | ● | .28 |

Carriage Cloth Duck:

| | | | |
|--|------|---------|--|
| 38-inch 2.00-yard enameling duck | yard | nominal | |
| 38-inch 1.74-yard | | nominal | |
| 72-inch 16.66-ounce | | nominal | |
| 72-inch 17.21-ounce | | nominal | |

Drills:

| | | | |
|-------------------------|------|---------|--|
| 38-inch 2.00-yard | yard | nominal | |
| 40-inch 2.47-yard | | nominal | |
| 52-inch 1.90-yard | | nominal | |
| 52-inch 1.95-yard | | nominal | |
| 60-inch 1.52-yard | | nominal | |

Yarns:

| | | | | |
|--------------------------------|------|-----|---|-----|
| Garden Hose, 12/2 cabled | pond | .26 | ● | .28 |
| Fire Hose 12/1 | | .25 | ● | .27 |

Imported Woolen Fabrics Specially Prepared for Rubberizing—Plain and Fancies:

| | | | | |
|---|------|-----|---|------|
| 63-inch, 3 1/4 to 7 1/2 ounces, per square yard | yard | .38 | ● | 1.55 |
| 36-inch, 2 1/4 to 5 ounces, per square yard | | .35 | ● | .85 |

Imported Plaid Lining (Union and Cotton):

| | | | | |
|---|------|-----|---|-----|
| 63-inch, 2 to 4 ounces, per square yard | yard | .35 | ● | .75 |
| 36-inch, 2 to 4 ounces per square yard | | .20 | ● | .45 |

Domestic Worsted Fabrics:

| | | | | |
|---|------|-----|---|-----|
| 36-inch, 4 1/2 to 8 ounces, per square yard | yard | .25 | ● | .45 |
|---|------|-----|---|-----|

Domestic Woven Plain Linings (Cotton):

| | | | | |
|---|------|---------|---|-----|
| 36-inch, 3 1/4 to 5 ounces, per square yard | yard | .15 1/2 | ● | .20 |
|---|------|---------|---|-----|

Raincoat Cloth (Cotton):

| | | | | |
|----------------------|------|---------|---|-----|
| Bombazine | yard | .06 | ● | .08 |
| wills | | .10 | ● | .15 |
| Tweed | | .20 | ● | .35 |
| Tweed, printed | | .06 | ● | .15 |
| Plaid | | .06 | ● | .08 |
| Repp | | .18 1/2 | ● | .22 |

Burlaps:

| | | | |
|-----------------------|-----------|-------|---|
| 32—7 1/2-ounce | 100 yards | none | |
| 40—7 1/2-ounce | | 7.90 | ● |
| 40—8-ounce | | 8.00 | ● |
| 40—10-ounce | | 11.25 | ● |
| 40—10 1/2-ounce | | 11.35 | ● |
| 45—7 1/2-ounce | | 9.10 | ● |
| 45—8-ounce | | 9.40 | ● |
| 48—10-ounce | | 15.50 | ● |



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